ApexPro™ Telemetry Server

Service Manual

2001989-178 Revision C

GE Medical Systems
Information Technologies

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For your notes

1 Introduction

For your notes

Manual Information

Revision History

Each page of this manual has the document part number and revision letter at the bottom of the page. The revision letter identifies the document's update level. The revision history of this document is summarized below.

Revision	Comment
A	Initial Release
B	Various edits supporting additional features/ feedback/clarifications obtained after previous release.
C	Various edits supporting feedback

Conventions

Bold text	Indicates keys on the keyboard, text to be entered, or hardware items such as buttons or switches on the equipment.
Italicized text	Indicates software terms that identify menu items, buttons, or options in various windows.
Ctrl+Esc	Indicates a keyboard operation. A plus (+) sign between the names of two keys indicates that you must press and hold the first key while pressing the second key once. For example, "Press **Ctrl+Esc**" means to press and hold down the **Ctrl** key while pressing the **Esc** key.
<**Space**>	Indicates you must press the spacebar. When instructions are given for typing a precise text string with one or more spaces, the point where the spacebar must be pressed is indicated as <**Space**>.
Enter	Indicates you must press the **Enter** or **Return** key on the keyboard. Do not type "enter".

Manual Purpose

This manual contains technical information about the ApexPro™ Telemetry Server (also referred to as the ApexPro Telemetry Server in this manual), supporting equipment maintenance and repair, down to the assembly level, considered field executable.

Where necessary, this manual identifies additional sources of relevant information and technical assistance.

Intended Audience

This manual is intended for use by service representatives and technical personnel who maintain, troubleshoot, or repair this equipment.

Safety Information

Responsibility of the Manufacturer

GE Medical Systems *Information Technologies* is responsible for the effects of safety, reliability, and performance only if:

- assembly operations, extensions, adjustments, modifications, or repairs are carried out by persons authorized by GE Medical Systems *Information Technologies*;
- the electrical installation of the relevant room complies with the requirements of the appropriate regulations; and
- the device is used in accordance with the instructions for use.

General

This device is intended for use under the direct supervision of a licensed health care practitioner.

This device is not intended for home use.

Federal law restricts this device to be sold by or on the order of a physician.

Contact GE Medical Systems *Information Technologies* for information before connecting any devices to the equipment that are not recommended in this manual.

Parts and accessories used must meet the requirements of the applicable IEC 60950 series safety standards for IT equipment.

Periodically, and whenever the integrity of the device is in doubt, test all functions.

The use of ACCESSORY equipment not complying with the equivalent safety requirements of the device may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:

- use of the accessory in the PATIENT VICINITY; and
- evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate IEC 60950 series safety standards for IT equipment.

If the installation of the equipment, in the USA, will use 240V rather than 120V, the source must be a center-tapped, 240V, single-phase circuit.

Warnings, Cautions and Notes

Warnings and Cautions are used throughout this manual and designate a degree or level of hazardous situations. A hazard is defined as a source of potential injury to a person.

DANGER

DANGER indicates an imminent hazard which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potential hazard or unsafe practice which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a potential hazard or unsafe practice which, if not avoided, could result in minor personal injury or product/ property damage.

NOTE

A **NOTE** provides application tips or other useful information.

ApexPro Telemetry Server Specific Hazards

WARNINGS

LOSS OF MONITORING — If it is necessary to shut down the ApexPro Telemetry Server, notify the site’s biomedical department so patient communications can be established with an alternative central station (the Bed Duplicator application can be used to temporarily transfer patients to an alternate ApexPro tower. See “Temporary Bed Transfer” on page 4-4). Shutting down the ApexPro Telemetry Server causes disruption of monitoring function at the CIC Pro.

EXPLOSION HAZARD — Do not use this equipment in the presence of flammable anesthetics, vapors or liquids. Severe burns/injury can result.

LOSS OF ALARMS/DATA — Use the ApexPro Telemetry Server with ApexPro V3.5 ONLY with CIC Pros running ApexPro V3.3. ApexPro V3.5 is backward-compatible with ApexPro V3.3 ONLY Other previous versions of ApexPro are NOT compatible with ApexPro V3.5. In-unit compatible sharing of the same care unit names between ApexPro Telemetry Server and ApexPro devices having incompatible software versions can result in lost or corrupted telemetry alarm defaults data and loss of audible alarms.

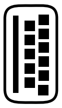
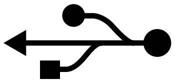
CAUTIONS

LOSS OF ALARMS/DATA — **Do not** load any software other than that specified by GE Medical Systems *Information Technologies* onto the ApexPro Telemetry Server. Installation of software not specified by GE Medical Systems *Information Technologies* can interfere with, or may cause damage to, the ApexPro Telemetry Server or loss or corruption of data.

LOSS OF FUNCTION/ALARMS/DATA — **Do not** connect any devices other than that specified by GE Medical Systems *Information Technologies* to the ApexPro Telemetry Server. Installation of devices not specified by GE Medical Systems *Information Technologies* may cause damage to the ApexPro Telemetry Server, can interfere with its operation or cause loss or corruption of data.

Equipment Symbols

The following symbols appear on the ApexPro Telemetry Server.

	Keyboard Icon: Denotes the keyboard port.
	USB Port Icon: Denotes the USB port.

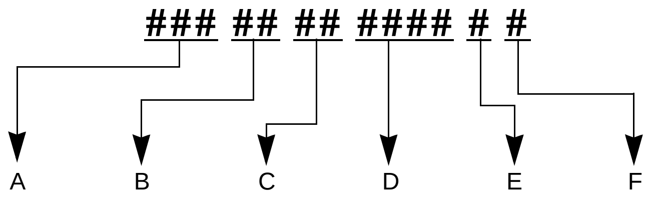
Service Requirements

Follow the service requirements listed below, and starting in “Maintenance” on page 4-1.

- Refer equipment servicing to GE Medical Systems *Information Technologies*’ authorized service personnel only.
- Any unauthorized attempt to repair equipment under warranty voids that warranty.
- It is the user’s responsibility to report the need for service to GE Medical Systems *Information Technologies* or to one of their authorized agents.
- Failure on the part of the responsible individual, hospital, or institution using this equipment to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.
- Regular maintenance, irrespective of usage, is essential to ensure that the equipment is always functional when required.

Equipment Identification

Every GE Medical Systems *Information Technologies* device has a unique serial number for identification. A sample of the information found on a serial number label is shown below.



	Description
A	product code[1]
B	year manufactured
C	fiscal week manufactured
D	production sequence number
E	manufacturing site
F	miscellaneous characteristic

[1] The product code for the ApexPro Telemetry Server is **SAH.**

For your notes

2 Equipment Overview

For your notes

ApexPro Telemetry Server Equipment Description

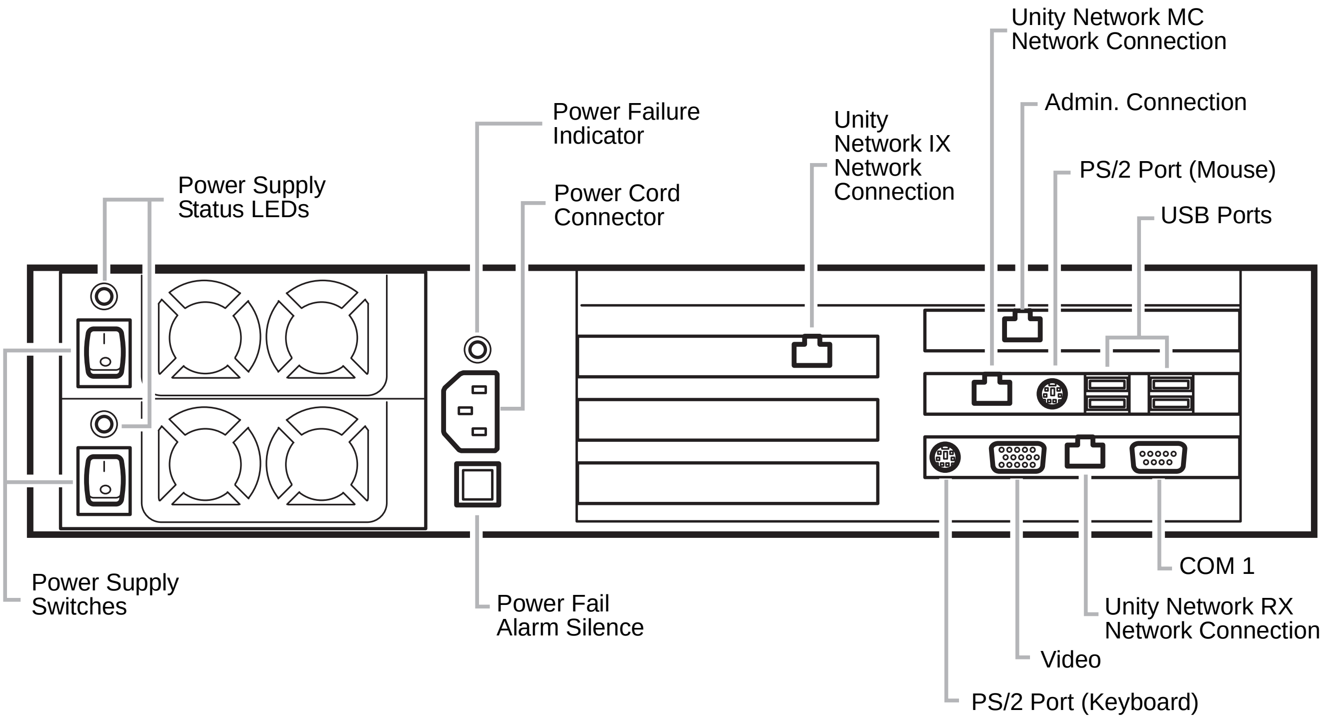
Basic Components

See “Technical Specifications” on page A-1 for additional information.

- Redundant internal hard disk drives (viewed as single “logical” drive)
- Power supplies
- CD-ROM drive
- Ethernet PCI (PC interface) plug-in circuit board
- 1024 x 768, 16-bit, 75 Hz video
- 512 MB RAM

Views

Back

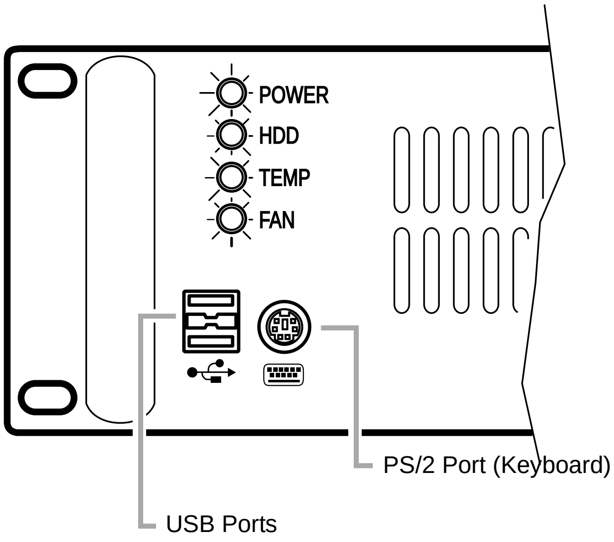

Unity Network MC
Network Connection
Admin. Connection
Power Failure
Indicator
Unity
Network IX
Network
Connection
PS/2 Port (Mouse)
Power Supply
Status LEDs
Power Cord
Connector
USB Ports
Power Supply
Switches
Power Fail
Alarm Silence
COM 1
Unity Network RX
Network Connection
Video
PS/2 Port (Keyboard)

001A

Front

WARNING

LOSS OF MONITORING/FUNCTION — DO NOT plug any unauthorized USB device, or device combinations into the USB ports. Unauthorized devices could impair ApexPro Telemetry Server function.



Peripheral Components

NOTE

The ApexPro Telemetry Server is designed to be a rack-mounted device. User/service interfaces are established through network connections. Direct keyboard, mouse and monitor connections are available, but not considered part of a typical installation.

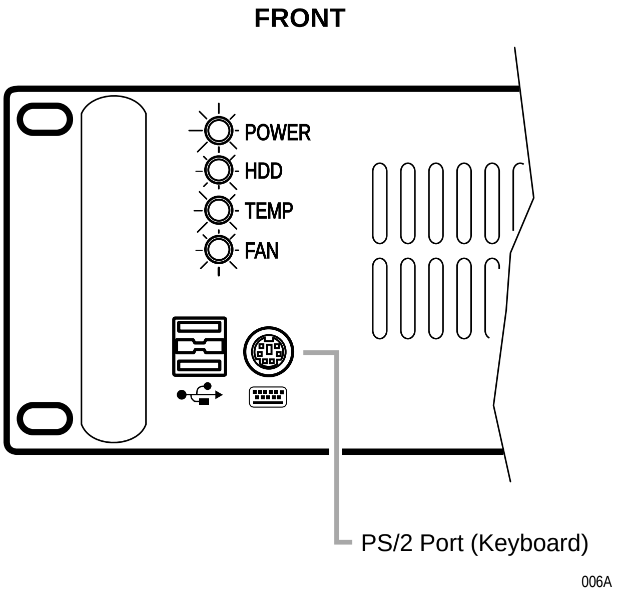
Mouse/Keyboard

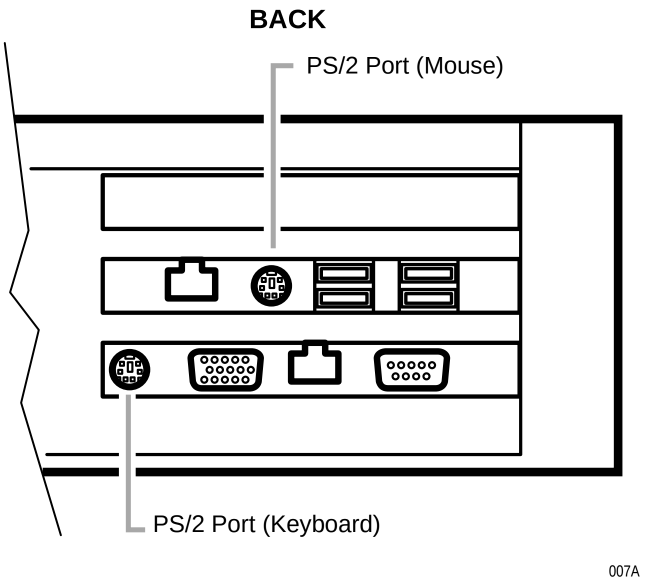
CAUTION

LOSS OF FUNCTION/ALARMS/DATA — **Do not** connect a keyboard/mouse other than that specified by GE Medical Systems *Information Technologies* to the ApexPro Telemetry Server. Installation of devices not specified by GE Medical Systems *Information Technologies* may cause damage to the ApexPro Telemetry Server, can interfere with its operation or cause loss or corruption of data.

Keyboard, video and mouse connections are provided for isolated service requirements.

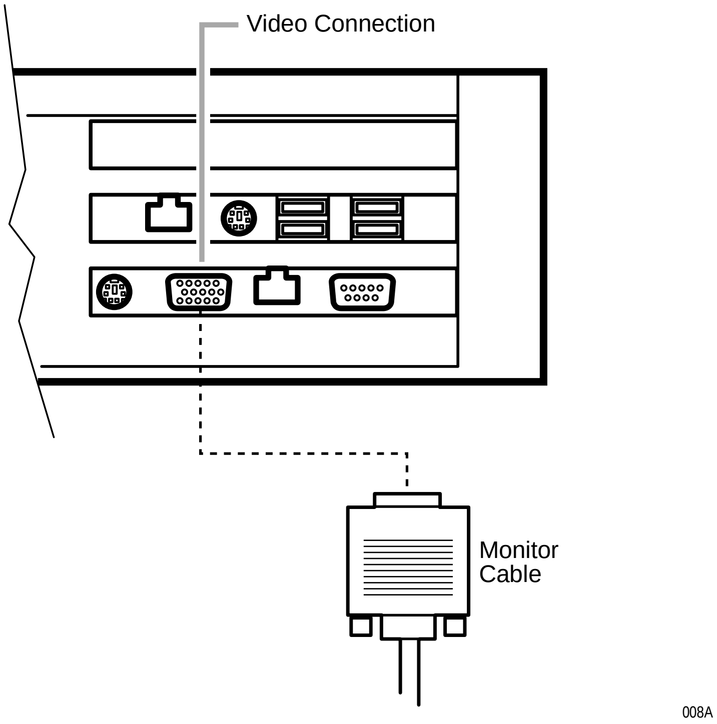
One PS/2 mouse connector is provided on the back, and two PS/2 keyboard connectors are provided (one on the front and one on the back) of the ApexPro Telemetry Server.


FRONT
POWER
HDD
TEMP
FAN
PS/2 Port (Keyboard)
006A

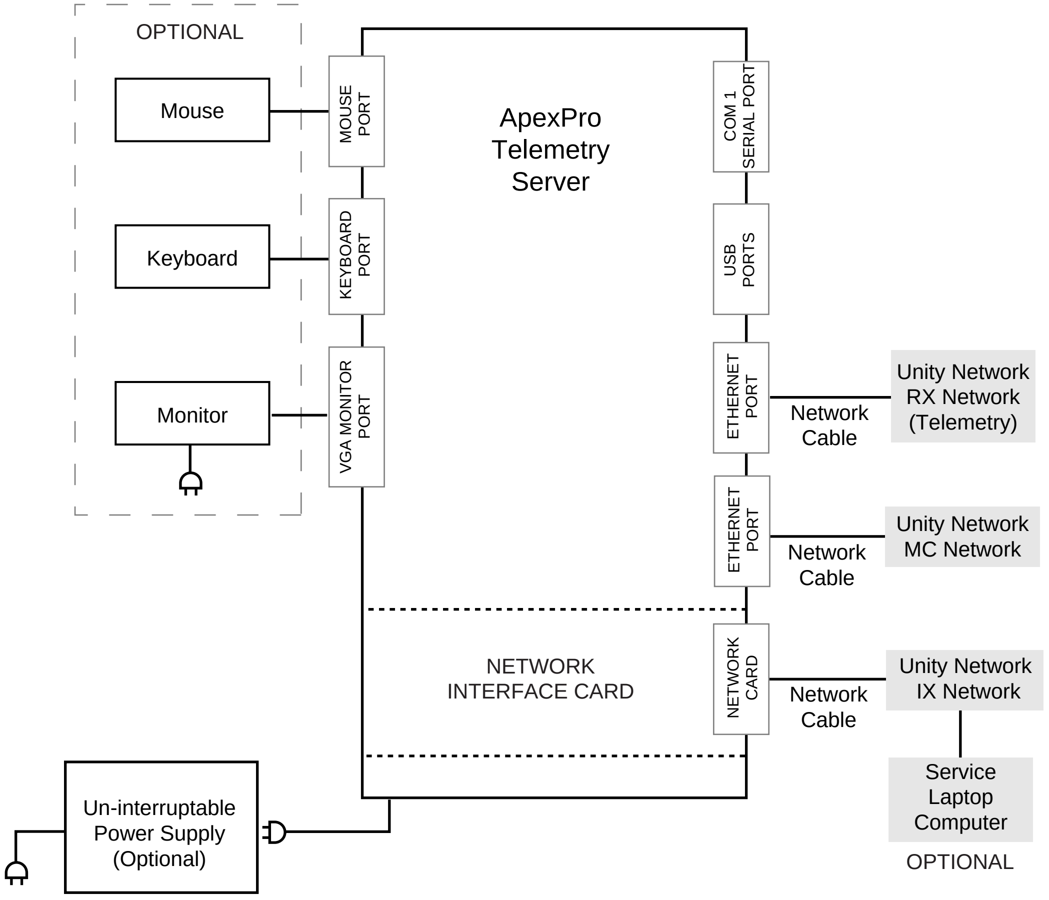

BACK
PS/2 Port (Mouse)
PS/2 Port (Keyboard)
007A

Monitor (Video)

The ApexPro Telemetry Server supports VGA video (1024 x 768 @ 75Hz). A video port is provided on the back of the unit for video monitor connection.


Video Connection
Monitor Cable
008A

Block Diagram


OPTIONAL
Mouse
Keyboard
Monitor
MOUSE PORT
KEYBOARD PORT
VGA MONITOR PORT
ApexPro Telemetry Server
COM 1 SERIAL PORT
USB PORTS
ETHERNET PORT
Network Cable
Unity Network RX Network (Telemetry)
ETHERNET PORT
Network Cable
Unity Network MC Network
NETWORK INTERFACE CARD
NETWORK CARD
Network Cable
Unity Network IX Network
Service Laptop Computer
OPTIONAL
Un-interruptable Power Supply (Optional)

003A

NOTE

Representational only. Drawing does not show exact location of cards or connectors.

Unity Network Description/Connection

The ApexPro Telemetry Server, running the ApexPro Host software, is a telemetry component of the Unity network family of devices. It is also the physical connection point between ApexPro telemetry devices and the CIC Pro Clinical Information Server.

Unity Network MC Network

The Unity Network MC (Mission Critical) network is used to connect the ApexPro Telemetry Server to the CIC Pro system.

The Unity Network MC network contains:

- Waveforms
- Parameters
- Alarms
- Other time-sensitive data

NOTE

The ApexPro Telemetry Server must be connected to the Unity Network MC network backbone.

Unity Network IX Network

The Unity Network IX (Information eXchange) network is used for:

- Network laser printing
- Server system (such as CIC Pro) interconnection for license sharing.
- CIC Pro Full Disclosure
- Remote Serviceability

NOTE

The Unity Network IX network is used if a connection to outside your facility is required (an internet connection, for example).

Unity Network RX Network

The Unity Network RX (Receiver eXchange) network is the connection to the telemetry system.

NOTE

Details may differ between specific types of ApexPro telemetry systems.

Network Connections Labels

The following table specifies the labels identifying Unity Network connections on the back of the ApexPro Telemetry Server.

Unity Network Connection	Connection Port
Unity Network MC network	Network Port marked “MC”
Unity Network IX network	Network Port marked “IX”
Unity Network RX network	Network Port marked “RX”

See “Views” on page 2-3 for the physical locations of the Unity Network connection ports of the back of the ApexPro Telemetry Server.

Theory of Operation

ApexPro Telemetry Server System

The ApexPro Telemetry Server is part of the ApexPro telemetry system. The ApexPro system provides real-time patient data/alarms to one or more CIC Pro patient monitoring stations.

ApexPro telemetry provides clinicians with patient physiological information while allowing for patient mobility.

The ApexPro telemetry system components include:

- ApexPro Telemetry Server
- CIC Pro
- Receiver System
- Antenna System
- Transmitter

ApexPro Telemetry Server

Provides the hardware/software connection between the ApexPro telemetry system and the Unity Network MC network.

The ApexPro Telemetry Server runs the ApexPro host software application, which performs the following functions:

- Analyzes data from the receiver system
- Assigns care unit and bed numbers to receivers
- Directs and controls ApexPro operations including EKpro, trends, histories, ECG processing and alarms
- Stores data to the ApexPro Telemetry Server hard drive
- Assigns/associates receiver and TTX numbers during patient admit
- Sends data via the Unity Network MC network to CIC Pro systems for patient data display

NOTE

> The ApexPro host software application does not provide user accessible functions, but instead relies on remote user interfaces, such as CIC Pro. Refer to the CIC Pro Clinical Information Center documentation for further details about the CIC Pro system.

Receiver System

The receiver system receives, demodulates, and decodes patient data received via the antenna system from a transmitter. The decoded data is then transferred to the ApexPro Telemetry Server via the Unity Network RX network. Patient data is not stored on the receiver system.

An installation can have more than one receiver system. Each receiver system can have up to 16 receivers. Each receiver can be associated with (and receive data from) one ApexPro transmitter.

Refer to the ApexPro Receiver System documentation for further details.

Antenna System

The antenna system transfers information from the transmitter to the receiver system for demodulation and waveform processing. Additionally, the antenna system increases ApexPro reception range, allowing patients wearing transmitters to move over an expanded area. As transmitters move around the facility, reception can switch from one antenna to another as required to maintain RF signal coverage.

The antenna system includes the receiver antenna and all associated components up to, but not including, the receiver system. There are two versions of the antenna system: one for U.S. applications (560–614MHz) and one for international applications (420–474MHz).

Refer to the ApexPro Antenna System site survey and installation manual for further details.

Transmitter

The transmitter connects to the patient and transmits patient telemetry data to the antenna system (which in turn, sends that data to the receiver system). The transmitter acquires patient data, converts it to digital format, and serially broadcasts the data along with pace, additional parameters (from devices attached to the serial ports), and status in an RF signal.

Refer to the ApexPro Telemetry Transmitter documentation for further details.

Unity Network Device Communication

The ApexPro system is a component in the GE Unity Network family of devices. GE Unity Network devices have specific communication requirements and behavior.

RWHAT Data

All Unity Network devices periodically broadcast information about themselves in RWHAT packets. All Unity Network monitoring devices listen for RWHAT packets, and maintain a database of RWHAT information received from all devices on the Unity Network. RWHAT packets contain a variety of device information, which includes communication port numbers, names, offered services, and unique IP addresses.

IP Addresses/Device Identification

Unique IP addresses for all Unity Network devices are vitally important. IP address information, along with other RWHAT data such as device names and offered services, allow Unity devices to communicate with each other effectively while performing various tasks.

Physical Device Location

Devices connected to the Unity Network located next to each other communicate in the same fashion as those located far apart. In some cases, the CIC Pro and ApexPro applications may even reside on the same computer. The physical location of any Unity Network device does not matter — each Unity Network device acts, as a separate entity, identified by a unique IP address.

ApexPro Towers

An ApexPro tower is the combination of the following components:

- Server computer running the ApexPro server software. The ApexPro Telemetry Server computer is an example of such a server computer.
- ApexPro receiver system. Connected to the ApexPro server computer via a Unity RX Network network connection.

ApexPro Towers, Antennas and Transmitters

Installations can have more than one ApexPro tower or antenna system. In such installations, ApexPro towers are not limited to a specific antenna, but will receive data from transmitters through any antenna in the installation and associate the data with the proper receiver. This allows for maximum patient mobility within the installation.

NOTE
Your specific installation may differ depending upon ApexPro telemetry system type.

Admit/TTX Master

Every installation has an ApexPro master tower. The ApexPro tower having the highest IP address determined through RWHAT packet monitoring, is the master tower. The ApexPro tower with the highest IP address is always the master tower, even on a mixed network having both ApexPro and CDT-LAN towers.

The master tower has two specific duties:

- It receives all telemetry patient admit requests and directs them to appropriate towers. This is referred to at the admit master function.
- It maintains a list of all in-use transmitter numbers, so that patient admissions can be prevented from using an already-allocated transmitter. This is referred to as the TTX master function.

CDT-LAN Installations

CDT-LAN is a telemetry system which precedes ApexPro. ApexPro is designed to allow for mixed networks including CDT-LAN running version 6D software.

ApexPro Receiver Configuration

Unlike CDT-LAN, ApexPro systems do not assign specific receivers to specific units — receivers in a tower can be generically configured to accept admits from any unit. This provides certain amount of receiver assignment flexibility and control, but it is important to understand the underlying mechanism in order to take full advantage of it.

An ApexPro tower can contain a pool of up to 16 receivers. Any number of these receivers from this pool can be “reserved” to only accept admits from specific units. Understand that this does not assign specific receiver slots. It assigns a quantity of them. When an admit occurs, any available receiver from the pool is used:

- IF the tower is configured to accept the admit from the unit.
- IF the unit has not used up it’s allotted number of reserved receivers.

If the number of receivers that are reserved is less than the total number of receivers in the tower, there are unassigned receivers available. For example: a tower has a pool of 16 receivers, and 8 of them are reserved for one or more units, leaving 8 unassigned receivers remaining.

Access to unassigned receivers can be allocated to certain units similarly to the way receivers are reserved, but the following exceptions apply:

- The number of unassigned receivers a unit can use is determined by how many receivers are not already reserved - AND/OR - not already used up by an admit.
- A unit given access to unassigned receivers cannot use any receivers reserved for a different unit, even if they are not in use.
- Once all receivers in a tower are either reserved or in use, a unit having access to unassigned receivers cannot admit to the tower.

A possible reserved/unassigned receiver scenario would be as follows:

1. A tower with 16 receivers has 8 reserved for unit A. Units B and C are listed to access the remaining 8 unassigned receivers. Additionally, Unit A is NOT listed as having permission to access the remaining 8 unassigned receivers.
2. Unit A uses it’s 8 reserved receivers regardless of how many other receivers are in use, but can only use up to 8 and no more.
3. Unit B admits 4 patients. These admits use up 4 of the unassigned receivers, leaving 4 still available.
4. Unit C admits 4 patients. These admits use up the remainder of the unassigned receivers.
5. Units B and C try to admit again, but cannot (all receivers are either reserved or in use).
6. If another tower is available, and Units B and C have the appropriate access, the admits take place at this other tower.
7. Unit B discharges 2 patients, making 2 receivers available.
8. Unit C admits 2 patients. All receivers are again either reserved or in use: Unit A has 8 (all reserved), Unit B has 2, and Unit C has 3.

The modify receiver PTSCONFIG command is used to maintain a configuration list at each tower for reserved and unassigned receiver allocations and their associated units.

The configuration list indicates how many receivers are reserved for specific units. The list also indicates whether specific units can admit to unassigned receivers. Units can have both reserved receivers and access to unassigned receivers.

See “ptsconfig Modify Receiver Command” on page 3-29 for more complete information about using the modify receiver PTSCONFIG command.

Sequence of Events When Admitting a Patient

Regardless of where an admit is initiated, whether from a bedside (in combo mode), a CIC Pro monitoring station or elsewhere, the process always goes through the following steps:

Admit Initiation/Creation

1. An admit request is created by the Unity Network device where the admit is initiated.
2. The initiating device searches it's searching RWHAT database and determines the ApexPro master tower IP address (See "RWHAT Data" on page 2-12).

   NOTE

   The master tower might not be the ApexPro tower physically connected to the initiating device (the ApexPro tower associated with a specific CIC Pro system, for example).

3. The admit request is sent by the initiating device to the master tower.

   NOTE

   If the admit fails at any point, the master tower informs the initiating device of the failure.

Master Tower Receives the Admit Request

4. The master tower receives the admit request. The request is in the form of a Unity network protocol packet, which contains the desired unit name, bed name, patient name, transmitter number, graph location, and age group—as well as an identification of the initiating device.
5. The master tower recognizes and begins to process the admit request.

TTX Validation

6. The master tower verifies that the requested transmitter number is not already in use by another patient.
7. If the transmitter number IS already in use (TTX not valid), an error response is sent back to the initiating device and the admit process stops.
8. If the transmitter number IS NOT in use (TTX valid), the admit process continues.

Telemetry Type Determination

9. The master tower examines the transmitter number (contained in the request sent by the initiating device) and determines the telemetry system type of the request. If the transmitter number is between 1 and 960, it belongs to a CDT-LAN system. If it's between 1000 and 9999, it belongs to an ApexPro system.
10. The master tower searches it's RWHAT database for an available tower/receiver having the correct telemetry type (See "RWHAT Data" on page 2-12).

Tower/Receiver Determination

11. Tower/receiver determination is comprised of either CDT-LAN or ApexPro admissions:

CDT–LAN Admissions

When the master tower determines the admit request is a CDT-LAN telemetry type, it searches the RWHAT database (See “RWHAT Data” on page 2-12) for a receiver offering the ADMIT service. The conditions used to pick a receiver are (in descending priority):

1. Discharged receiver with the same unit name as is contained in the admit packet.
2. Discharged universal receiver (unit name “mei”).

If neither conditions are true, an admit failure response is sent back to the initiating device, indicating that no CDT–LAN receivers are available.

If either condition is true, the admit request is forwarded to the appropriate receiver.

ApexPro Admissions

When the master tower determines the admit request is an ApexPro telemetry type, it searches the RWHAT database (See “RWHAT Data” on page 2-12) for ApexPro towers with available receivers.

RWHAT data contains the following information about ApexPro towers and their receivers:

- The units a tower can accept admits from
- The number of receivers a tower has reserved for specific units
- The units a tower can accept admits from (to unassigned receivers)

Additionally, if no unit names are entered for a tower (i.e., the tower accepts admits for any unit), the receivers are classified as universal receivers (unit name “mei”). This list has no individual receiver information in it — a unit’s presence in the list only indicates that at least one receiver in the unit is available on the ApexPro tower.

The following priority conditions are used to determine which ApexPro tower should receive the forwarded admit request (in descending priority):

a. A tower that has a receiver reserved for the unit name in the admit packet.

b. A tower that has a receiver available for the unit name in the admit packet, but not reserved. (This indicates that all receivers assigned to the unit are admitted, that the unit is configured to use unassigned receivers, and that an unassigned receiver is still available.)

c. A tower that has a universal receiver available (unit name “mei”).

If none of these conditions are true, an admit failure response is sent back to the initiating device, indicating that no ApexPro receivers are available.

If any of the conditions are true, the admit request is forwarded to the appropriate tower.

CDT-LAN Admit Request Forwarding

If the admit request was determined to be of CDT-LAN telemetry type, the admit request is sent to the selected CDT-LAN receiver, and the admit is processed.

NOTE

This is different from ApexPro in that ApexPro admit requests are sent to a selected tower, not a specific receiver.

NOTE

The master tower cycles CDT–LAN admissions through all available receivers, so the admit/discharge/admit sequence does not exclusively use the same receiver over and over. This is done because, if a particular receiver malfunctions, and the user discharges and then readmits a patient, the next admit will go to a different receiver.

ApexPro Admit Request Forwarding

If the admit request was determined to be of ApexPro telemetry type, the admit request is sent to the selected ApexPro tower, the tower assigns the admit to an available receiver and the admit is processed.

NOTE

This is different from CDT-LAN. CDT-LAN admit requests are sent to a selected receiver, not a specific tower.

NOTE

The master tower cycles ApexPro admissions through all available towers, and subsequently, the towers themselves cycle admissions through all available receivers. This is done so the admit/discharge/admit sequence does not exclusively use the same receiver over and over. This is done because, if a particular receiver malfunctions, and the user discharges and then readmits a patient, the next admit will go to a different receiver, potentially on a different tower.

Service Utilities

ApexPro Telemetry Server Service Logons

The following logons are “full-access” administrative accounts used to update software and make changes to the operating system configuration.

The two accounts are separate but similar. One is for the site administrator, the other for field service personnel.

The following table lists all logons associated with ApexPro Telemetry Server service.

ApexPro Telemetry Server Service Logons				
Logon Description	**User Name**	**Password**	**IE Address**	**Additional Information**
Webmin Service	biomed	f1uv1us7	http://[ATS Unity Network IX network IP Address]:10000	“Webmin Logons” on page 2-21
VNC	N/A	prism1,3,5,7	http://[ATS Unity Network IX network IP Address]:5800	“VNC Logon” on page 2-20
ApexPro Telemetry Server Administrator	cicadm	cicadm1,3,5,7		

Configure FE Laptop

Configure IP Address

The Field Engineer (FE) laptop must be configured to the saem IP addressing scheme as the ATS in order to connect to the ATS remotely within the hospital intranet (used to gain access to ATS Webmin or the ATS desktop). To configure the laptop perform the following steps.

Windows NT or Windows 98

1. From the Windows taskbar, click *Start* > *Settings* > *Control Panel*.
2. Click the *Network* icon in the *Control Panel* window.
3. On the *Protocol* (or *Configuration*) tab, select the appropriate TCP/IP Ethernet adapter for your network card.
4. Select *Properties*.
5. Record the current IP address and subnet mask so you can restore them later.
6. Click *Specify an IP address*.

7. Type IP address, subnet mask and default gateway values matching the Unity Network IX network domain for the ApexPro Telemetry Server. For example:
   IP Address: 192.168.x.x
   Netmask: 255.255.0.0
8. Click *OK*.
9. Click *OK*.
10. Click *Yes* to restart the service laptop.

Windows 2000

1. From the Windows taskbar, click *Start* > *Settings* > *Network and Dial-up Connections*.
2. Right click *Local Area Connection*.
3. Select *Properties*.
4. Click *Internet Protocol (TCP/IP)*.
5. Click *Properties.*
6. Record the current IP address and subnet mask so you can restore them later.
7. Click *Use the following IP address*.
8. Type IP address, subnet mask and default gateway values matching the Unity Network IX network domain for the ApexPro Telemetry Server. For example:
   IP Address: 192.168.x.x
   Netmask: 255.255.0.0
9. Click *OK*.
10. Click *OK*.
11. For Windows 2000, instead of restarting the service laptop, you can click *Start > Settings > Network and Dial-up Connections*, right-click on *Local Area Connection*, select *Disable* and then right-click again and select *Enable.*

Configure Internet Browser

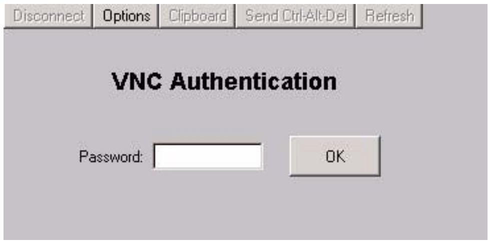
The FE’s Internet browser is configured to use GE specific configuration script to access GE internal websites. The following steps must be performed to gain remote access to ATS within the hospital intranet (ATS Webmin / ATS Desktop):

1. Right-click on the *Internet Explorer* icon on the Desktop and select *Properties*.
2. Select the *Connections* tab.
3. Click *LAN settings*.
4. Check *Automatically detect settings*.
5. Uncheck *Use automatic configuration script*.
6. Uncheck *Use a proxy server.*
7. Click *OK*.

VNC Logon

Virtual Network Computing (VNC) is a remote desktop application that allows for running the ApexPro Telemetry Server desktop from a remote computer.

1. Start a VNC session by starting Internet Explorer and type **http://[ApexPro Telemetry Server Unity Network IX network IP address]:5800** into the *Address* field and press **Enter**.
2. When prompted, type **prism1,3,5,7** for the password and click *OK*.


Disconnect
Options
Clipboard
Send Ctrl-Alt-Del
Refresh
VNC Authentication
Password:
OK

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3. If the server is in sleep mode, or otherwise requires a login to start operation, click *Ctrl-Alt-Delete* at the top of the window.

Webmin Overview

Webmin is an internet-based web application is used for ApexPro Telemetry Server administration and service.

Webmin Logons

The ApexPro Telemetry Server Webmin application running on the ApexPro Telemetry Server computer is accessed using a separate computer connected to the ApexPro Telemetry Server computer through the Unity Network IX network.

NOTE

If a direct connection to the ATS is required, configure a service laptop for direct ethernet connection with the ApexPro Telemetry Server according to "Service Laptop Direct Connection" on page B-3.

1. Start the Internet Explorer application.
2. Type **http://[ApexPro Telemetry Server Unity Network IX network IP address]:10000** into the *Address* field and press **Enter**.

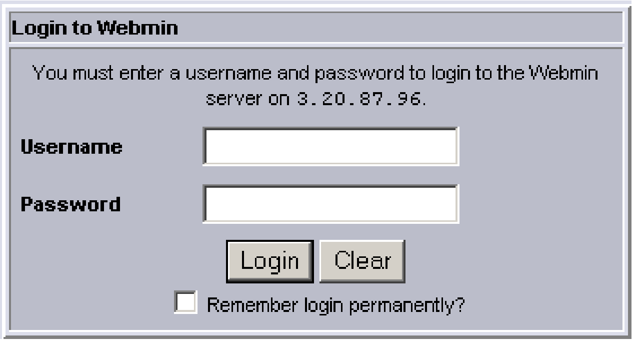
   NOTE

   [ApexPro Telemetry Server computer IP address] is the Unity Network IX network IP address for the ApexPro Telemetry Server computer.

   - Username: **biomed**
   - Password: **f1uv1us7**

   NOTE

   This passwords use the number **1**, not the letter **l**.



Login to Webmin

You must enter a username and password to login to the Webmin server on 3.20.87.96.

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NOTE

Click the *Remember login permanently?* checkbox if you want the password automatically entered whenever you log in to Webmin.

Webmin Tab Screens

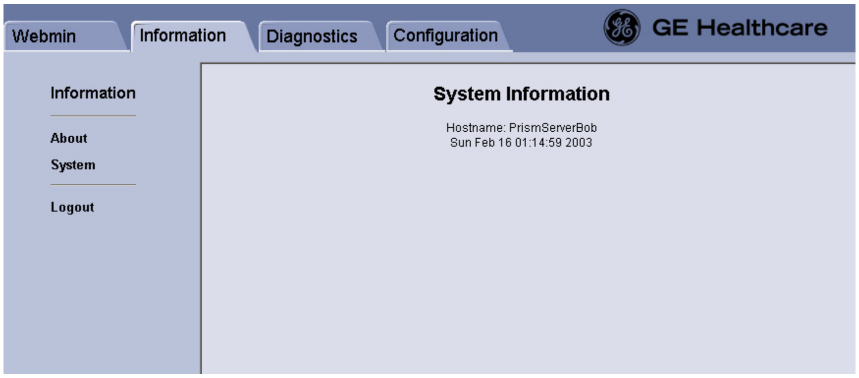
NOTE

Webmin features and functionality will vary depending upon your installation.

Webmin functionality is divided across a number of different tab screens. Refer to the following locations for more information about functionality associated with each screen:

- "Webmin Information Tab" on page 2-22
- "Webmin Diagnostics Tab" on page 2-23
- "Webmin Configuration Tab" on page 2-24

Webmin *Information* Tab



System Information

Hostname: PrismServerBob
Sun Feb 16 01:14:59 2003

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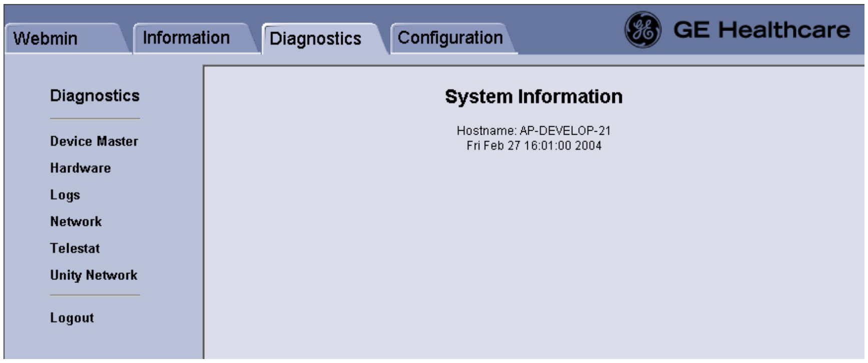
The following links are found on the *Information* tab.

Link Name	Description
About	See "About" on page 2-25. Displays ApexPro software version, and many system information values.
System	See "System" on page 2-25. Displays some information about the ApexPro Telemetry Server system, including: *Platform Version, Model, Serial Number, System Name, Name, Asset Number, Location*.
Logout	Used to log user out of Webmin.

Webmin *Diagnostics* Tab

NOTE

Diagnostics tab features and functionality will vary depending upon your installation.



System Information

Hostname: AP-DEVELOP-21
Fri Feb 27 16:01:00 2004

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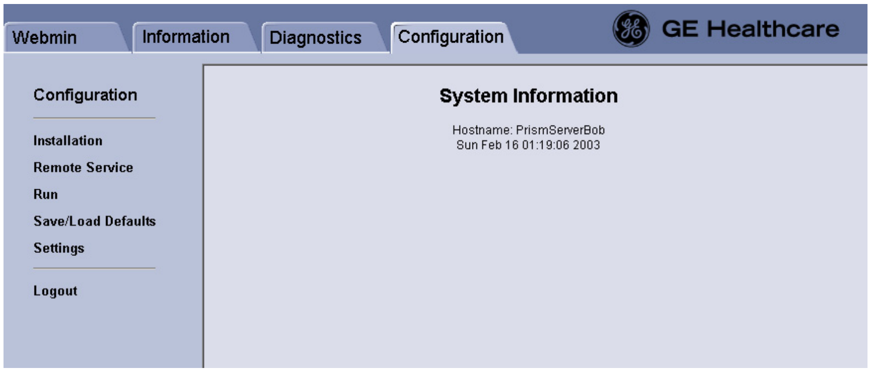
The following links are found on the *Diagnostics* tab.

Diagnostics **Tab Links and Descriptions**

Link Name	Description
Device Master	Used for ApexPro Telemetry Server Configuration setting (determines type of telemetry system). Also includes utilities for viewing VTXP statistics, VRTP statistics, AP statistics and AP configuration. May not apply to your system. See the separate service or configuration documentation for your specific ApexPro installation for more information about your specific telemetry system.
Hardware	See “Webmin Hardware Monitoring Utilities” on page 5-14. Used to view current operating temperature and operation status of fans, hard drives and power supplies.
Logs	See “View Logs” on page 5-20 and “Download Logs” on page 5-21. Used to view and download log files.
Network	See “Display Network Adapter/Serial Port Information” on page 2-40. Displays network adapter and serial port details.
Telestat	See “Download Telestat Logs” on page 5-22. Used to download telemetry statistics (Telestat) log files.
Unity Network.	See “Unity Network Device Detection” on page 5-18. Displays information about Unity devices detected on the Unity Network MC network.
Logout	Used to log user out of Webmin.

Webmin *Configuration* Tab


Webmin
Information
Diagnostics
Configuration
GE Healthcare
Configuration
Installation
Remote Service
Run
Save/Load Defaults
Settings
Logout

System Information

Hostname: PrismServerBob
Sun Feb 16 01:19:06 2003

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The following links are found on the *Configuration* tab.

Link Name	Description
Installation	Used for ApexPro Telemetry Server software upgrade installation.
Remote Service	See "Remote Services Configuration" on page 3-24. Used for remote connection parameter configuration.
Run	See "Stop/Start/Restart ApexPro Telemetry Server" on page 2-29. Used for remote ApexPro Telemetry Server software, and operating system, start, stop and restart.
Save/Load Defaults	See "Save/Load Defaults" on page 3-32. Used for system defaults back-up/restore and disaster recovery.
Settings	Used for ApexPro Telemetry Server IP address, ApexPro mode, tower/unit names and AC power frequency configuration. See: ■ "IP Address Configuration" on page 3-22 ■ "Setting the Telemetry System Type" on page 3-27 ■ "Setting the ApexPro Telemetry Server Tower and Unit Name" on page 3-28 ■ "ptsconfig Modify Receiver Command" on page 3-29
Logout	Used to log out of Webmin.

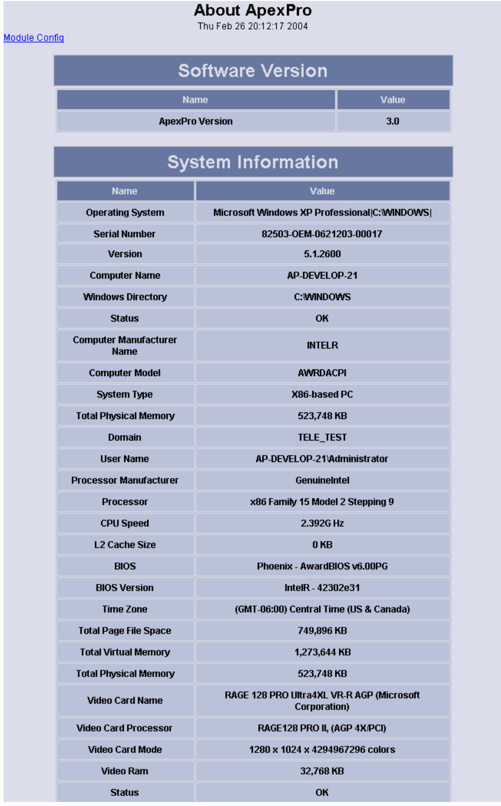
View System Information Using Webmin

The Webmin application displays two kinds of System Information: *About* and *System.*

About

About can be used to view ApexPro Telemetry Server system, and ApexPro version, information.

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Information* tab.
3. Click the *About* link under the *Information* menu along the left side of the window.



About ApexPro

Thu Feb 26 20:12:17 2004

Software Version

Name	Value
ApexPro Version	3.0

System Information

Name	Value
Operating System	Microsoft Windows XP Professional|C:\WINDOWS|
Serial Number	82503-OEM-0621203-00017
Version	5.1.2600
Computer Name	AP-DEVELOP-21
Windows Directory	C:\WINDOWS
Status	OK
Computer Manufacturer Name	INTELR
Computer Model	AWRDACPI
System Type	X86-based PC
Total Physical Memory	523,748 KB
Domain	TELE_TEST
User Name	AP-DEVELOP-21\Administrator
Processor Manufacturer	GenuineIntel
Processor	x86 Family 15 Model 2 Stepping 9
CPU Speed	2.392G Hz
L2 Cache Size	0 KB
BIOS	Phoenix - AwardBIOS v6.00PG
BIOS Version	IntelR - 42302e31
Time Zone	(GMT-06:00) Central Time (US & Canada)
Total Page File Space	749,896 KB
Total Virtual Memory	1,273,644 KB
Total Physical Memory	523,748 KB
Video Card Name	RAGE 128 PRO Ultra4XL VR-R AGP (Microsoft Corporation)
Video Card Processor	RAGE128 PRO II, (AGP 4X/PCI)
Video Card Mode	1280 x 1024 x 4294967296 colors
Video Ram	32,768 KB
Status	OK

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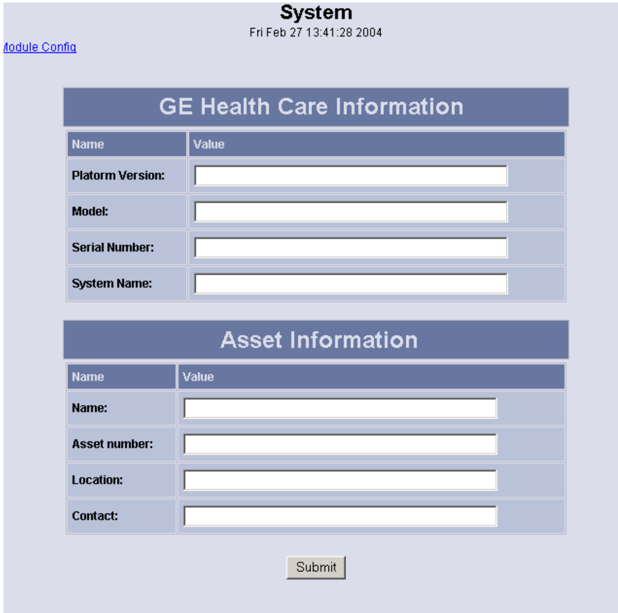
System

System can be used to view high-level ApexPro Telemetry Server administrative functions, such as platform version, model and serial numbers, names, asset numbers, locations, etc.

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Information* tab.

3. Click the *System* link under the *Information* menu along the left side of the window.



System

Fri Feb 27 13:41:28 2004

Module Config

GE Health Care Information

Name	Value
Platorm Version:	
Model:	
Serial Number:	
System Name:	

Asset Information

Name	Value
Name:	
Asset number:	
Location:	
Contact:	

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ATS Control Center

WARNING

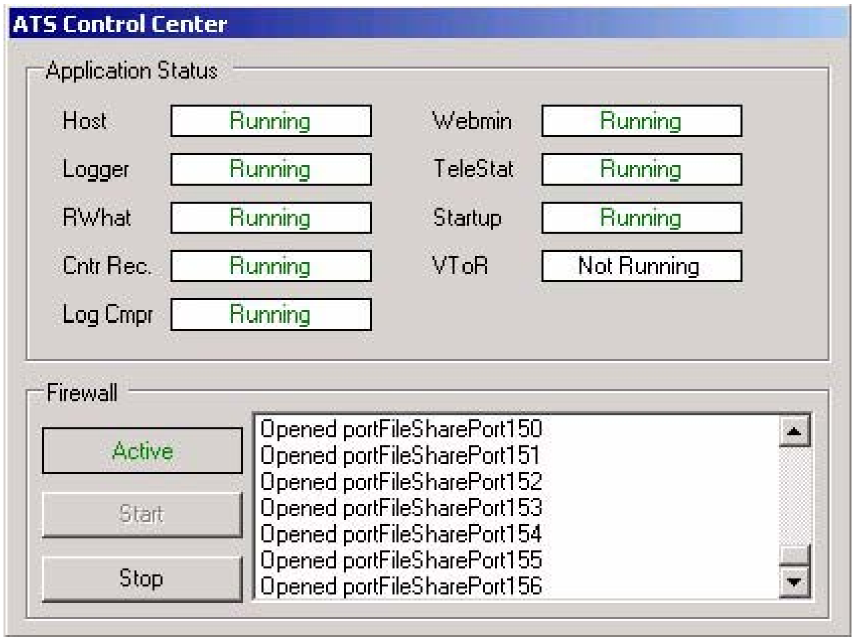
DATA LOSS/CORRUPTION — Do not shut down the ApexPro Telemetry Server firewall during normal operation. The ApexPro Telemetry Server firewall provides secure/limited connectivity to the Unity Network IX network, which is potentially exposed to internet or other external networks.

The *ATS Control Center* is an application that is displayed on the ApexPro Telemetry Server desktop and launches automatically after bootup. It displays the current status of ApexPro Telemetry Server software components.

The *ATS Control Center* is also used to start, stop or disable the ApexPro Telemetry Server firewall. Messages displaying in the *Firewall* list box are associated with firewall startup/shutdown activity only.

NOTE

The *ATS Control Center* firewall applies only to the Unity Network IX network connection. ApexPro Telemetry Server ping functionality on this network is disabled when the firewall is enabled.



Host	Running	Webmin	Running
Logger	Running	TeleStat	Running
RWhat	Running	Startup	Running
Cntr Rec.	Running	VToR	Not Running
Log Cmpr	Running		

```
Opened portFileSharePort150
Opened portFileSharePort151
Opened portFileSharePort152
Opened portFileSharePort153
Opened portFileSharePort154
Opened portFileSharePort155
Opened portFileSharePort156
```

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Component	Description
Application Status	Displays the status of various ApexPro Telemetry Server processes.
Host	Displays Host application process.
Logger	Displays Logging process.

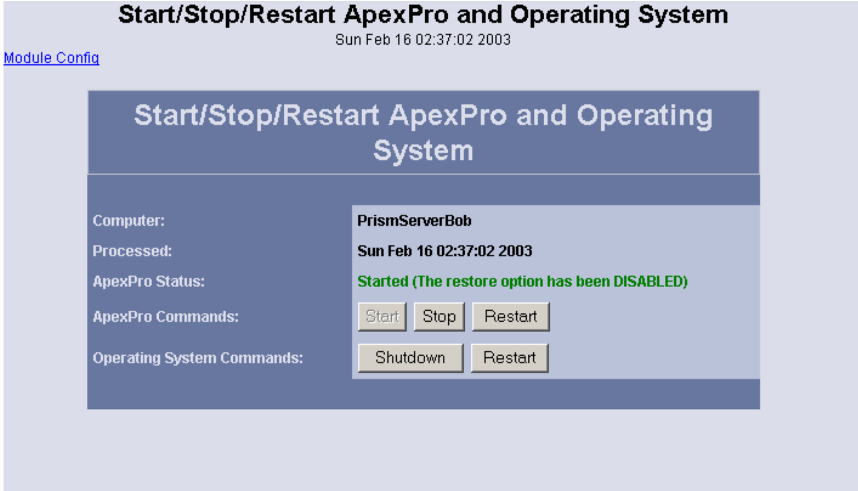
Component	Description
RWhat	Displays RWhat process.
Cntr Rec.	Displays Memory utilization process.
Log Cmpr	Displays Log file compression process.
Webmin	Displays Perl application launch process (Perl required by Webmin).
Telestat	Displays Telemetry statistics process.
Startup	Displays ApexPro Telemetry Server startup process.
Vtor	Displays ApexPro Telemetry Server mode status. Mode is “Vtor” when status is *Running*; mode is “rack” when status is *Not Running.*
Firewall	Displays ApexPro Telemetry Server firewall status messages. Buttons in this section are used to start, stop or disable the firewall.
Disabled	Displays status of the firewall: either *Active* or *Disabled*.
Start button	Starts the firewall.
Stop button	Stops the firewall.

Stop/Start/Restart ApexPro Telemetry Server

WARNING

LOSS OF MONITORING — Before stopping or restarting the ApexPro Telemetry Server software, or shutting down or restarting the ApexPro Telemetry Server computer, notify the site’s biomedical department so patient communications can be established with an alternative central station (the Bed Duplicator application can be used to temporarily transfer patients to an alternate ApexPro tower. See “Temporary Bed Transfer” on page 4-4). Shut down of the ApexPro Telemetry Server causes disruption of monitoring function at the CIC Pro.

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Configuration* tab.
3. Click the *Run* link.
4. Select one of the following:
   - To stop the ApexPro Telemetry Server software, click *Stop*, next to *ApexPro Commands*.
   - To restart the ApexPro Telemetry Server software, click *Restart*, next to *ApexPro Commands.*
   - To shutdown the ApexPro Telemetry Server computer, click *Shutdown*, next to *Operating System Commands*.
   - To restart the ApexPro Telemetry Server computer, click *Restart*, next to *Operating System Commands.*



Start/Stop/Restart ApexPro and Operating System

Sun Feb 16 02:37:02 2003

Module Config

Start/Stop/Restart ApexPro and Operating System

Computer:	PrismServerBob
Processed:	Sun Feb 16 02:37:02 2003
ApexPro Status:	Started (The restore option has been DISABLED)
ApexPro Commands:	Start Stop Restart
Operating System Commands:	Shutdown Restart

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Bed Duplicator

NOTE

The Bed Duplicator is intended for temporary bed duplication. Permanent duplication of bed data is not recommended because it can cause data corruption. For information about using the Bed Duplicator application to temporarily transfer beds see “Temporary Bed Transfer” on page 4-4.

The Bed Duplicator application is used to copy patient/bed data from one ApexPro tower to another. This is useful for maintaining patient monitoring when a tower must be shut down for service or maintenance.

The Bed Duplicator does not copy Full Disclosure (FD) data. FD is a function of the CIC Pro central station. Patient FD data is maintained at the CIC Pro central station, not at the ApexPro tower.

Bed Duplicator Startup

1. The Bed Duplicator requires a VNC connection. See “VNC Logon” on page 2-20.

   NOTE

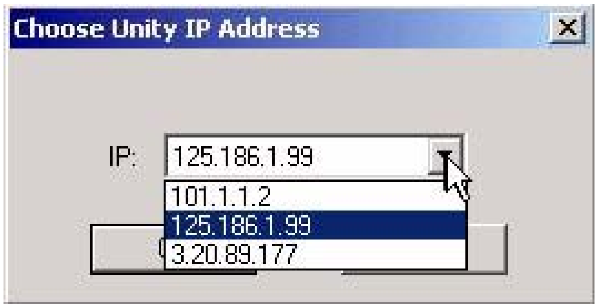
   The Bed Duplicator can be run from any ApexPro Telemetry Server on the network, and can copy/duplicate beds to/from any available ApexPro Telemetry Server or ApexPro tower.

   It may be useful to run the Bed Duplicator from an ApexPro Telemetry Server that will not be taken offline because the Bed Duplicator application displays network bed admit/discharge activity in the *Log Messages* window. *Log Messages* information is purged if the Bed Duplicator application is shut down.

2. Start the Windows Explorer application from the ApexPro Telemetry Server desktop in the VNC session window.
3. Using Windows Explorer, navigate to the *C:\Program Files\Marquette\PTS\X.X* (X = software version) directory.
4. Double-click the *BedDuplicator.exe* file.
5. Select the IP address of the tower containing beds needing duplication. Click *OK*.

   NOTE

   To change towers, select *Edit* > *Configure*.



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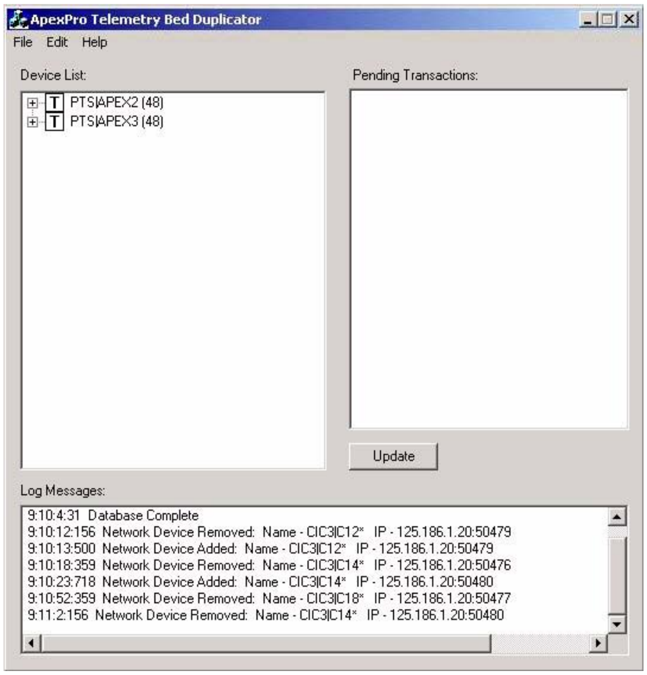
The message *Waiting for network communication* displays as the Bed Duplicator starts up. When startup is complete, the available towers are listed in the *Device List*.


ApexPro Telemetry Bed Duplicator
File
Edit
Help
Device List:
Pending Transactions:
Update
Log Messages:

```
PTS|APEX2 (48)
PTS|APEX3 (48)
```

```
9:10:4:31  Database Complete
9:10:12:156  Network Device Removed:  Name - CIC3|C12*   IP - 125.186.1.20:50479
9:10:13:500  Network Device Added:  Name - CIC3|C12*   IP - 125.186.1.20:50479
9:10:18:359  Network Device Removed:  Name - CIC3|C14*   IP - 125.186.1.20:50476
9:10:23:718  Network Device Added:  Name - CIC3|C14*   IP - 125.186.1.20:50480
9:10:52:359  Network Device Removed:  Name - CIC3|C18*   IP - 125.186.1.20:50477
9:11:2:156  Network Device Removed:  Name - CIC3|C14*   IP - 125.186.1.20:50480
```

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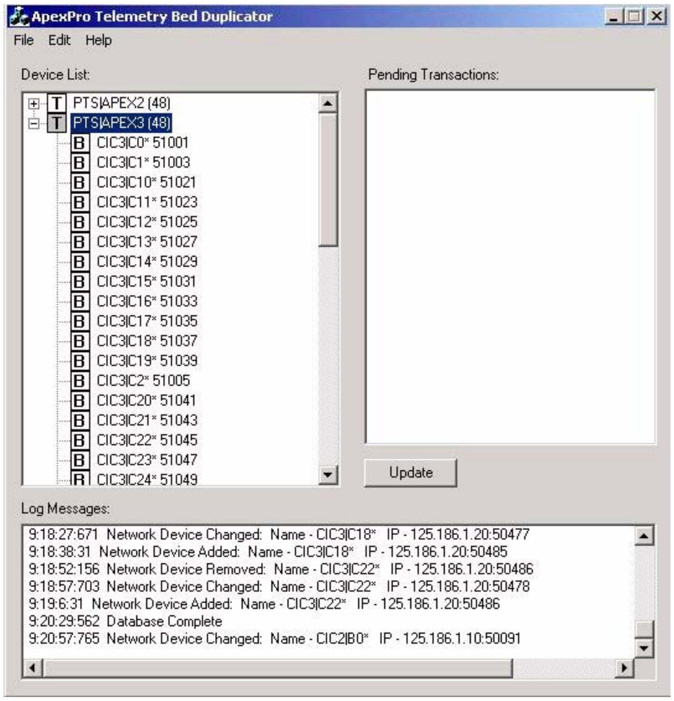
Bed Duplicator Navigation

To view beds admitted to a tower, click the plus sign (+) to the left of the tower.


ApexPro Telemetry Bed Duplicator
File
Edit
Help
Device List:
Pending Transactions:
Update
Log Messages:

```
PTS|APEX2 (48)
PTS|APEX3 (48)
    CIC3|C0* 51001
    CIC3|C1* 51003
    CIC3|C10* 51021
    CIC3|C11* 51023
    CIC3|C12* 51025
    CIC3|C13* 51027
    CIC3|C14* 51029
    CIC3|C15* 51031
    CIC3|C16* 51033
    CIC3|C17* 51035
    CIC3|C18* 51037
    CIC3|C19* 51039
    CIC3|C2* 51005
    CIC3|C20* 51041
    CIC3|C21* 51043
    CIC3|C22* 51045
    CIC3|C23* 51047
    CIC3|C24* 51049
```

```
9:18:27:671  Network Device Changed:  Name - CIC3|C18*   IP - 125.186.1.20:50477
9:18:38:31  Network Device Added:  Name - CIC3|C18*   IP - 125.186.1.20:50485
9:18:52:156  Network Device Removed:  Name - CIC3|C22*   IP - 125.186.1.20:50486
9:18:57:703  Network Device Changed:  Name - CIC3|C22*   IP - 125.186.1.20:50478
9:19:6:31  Network Device Added:  Name - CIC3|C22*   IP - 125.186.1.20:50486
9:20:29:562  Database Complete
9:20:57:765  Network Device Changed:  Name - CIC2|B0*   IP - 125.186.1.10:50091
```

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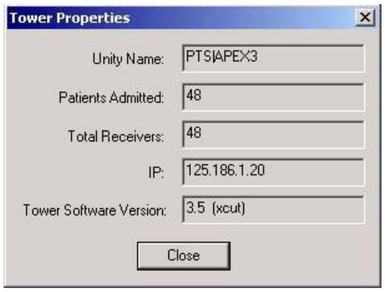
Tower/Bed Properties

To view properties information, right-click the bed/tower in the *Device List*, and select *Properties*.

Tower Properties



Unity Name: PTS|APEX3
Patients Admitted: 48
Total Receivers: 48
IP: 125.186.1.20
Tower Software Version: 3.5 (xcut)

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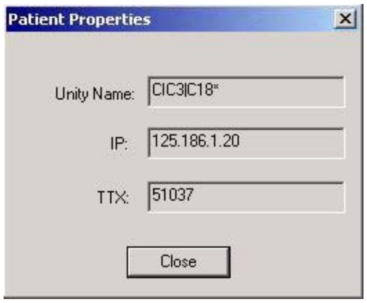
Bed/Patient Properties



Unity Name: CIC3|C18*
IP: 125.186.1.20
TTX: 51037

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Bed Duplicator Shut Down

Once all pending processes are completed (no messages are displayed in the *Pending Transactions* field), select *File > Exit*.

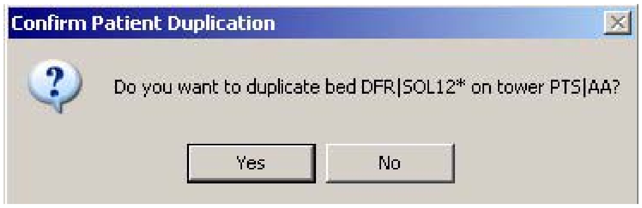
Bed Duplication

WARNING
LOSS OF MONITORING — If sufficient capacity is not available at either an alternate tower or a CIC Pro central station to account all the beds on the ApexPro Telemetry Server, notify the site's biomedical department so patient communications can be established using an alternative method. Patient monitoring will be lost if this instruction is not followed.

NOTE

Beds cannot be batch duplicated; they must be duplicated one at a time.

1. Select the bed you want to copy and drag it to the alternate tower.
2. Click *Yes* in the *Confirm Patient Duplication* window.

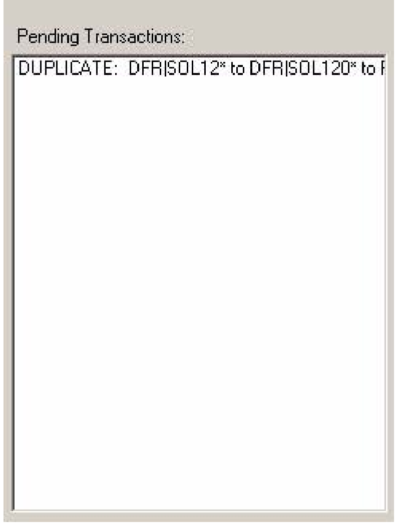


Confirm Patient Duplication

Do you want to duplicate bed DFR|SOL12* on tower PTS|AA?

221A

3. As the bed is duplicated to the alternate tower, a message displays in *Pending Transactions*. Pending Transaction messages disappear once duplication is complete.



Pending Transactions:

DUPLICATE: DFR|SOL12* to DFR|SOL120* to

222A

4. The bed is copied to the alternate tower and renamed, with the new name is based on the old. Renaming is required because the system won’t allow duplicate names.
5. The duplicated bed is admitted to the alternate tower when it is copied.

   NOTE

   When the duplicated bed is admitted to the alternate tower, it is automatically moved into an available, unlocked slot on the CIC Pro.

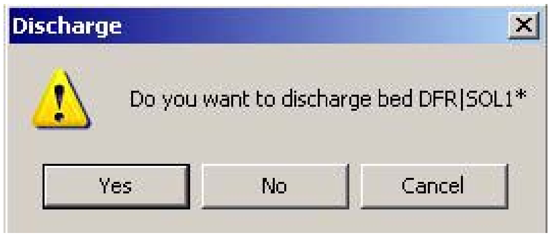
   If there are no unlocked slots available on the CIC Pro, a warning message is displayed. A slot can be unlocked to allow the bed to display on the CIC Pro.

   If there are no available slots on the CIC Pro, a warning message is displayed and the bed is not monitored.

Bed Discharge

Beds can be discharged as they are no longer needed:

1. Right-click the bed to discharge.
2. Select *Discharge*.
3. Click *Yes* in the *Discharge* window.


Discharge

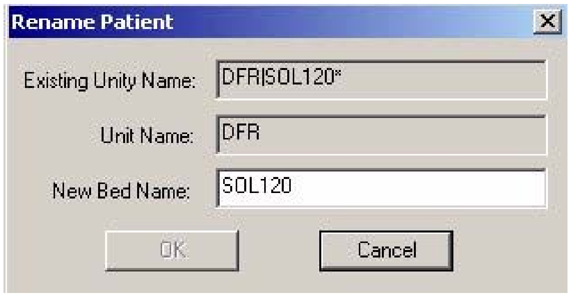
Do you want to discharge bed DFR|SOL1*

225A

4. As the bed is discharged, a message displays in *Pending Transaction*. Pending Transaction messages disappear once the discharge is complete.

Bed Renaming

1. Right-click the bed to rename
2. Select *Rename*.
3. Type the new bed name into the *New Bed Name* field and click *OK*.


Rename Patient

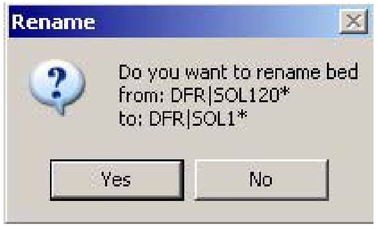
Existing Unity Name: DFR|SOL120*

Unit Name: DFR

New Bed Name: SOL120

223A

4. Click *Yes* in the *Rename* window.


Rename

Do you want to rename bed
from: DFR|SOL120*
to: DFR|SOL1*

224A

5. As the bed name is changed, a message displays in *Pending Transaction*. Pending Transaction messages disappear once renaming is complete.

ApexPro PTSCONFIG Utility

The PTSCONFIG utility is a console application that allows you to configure the ApexPro application.

To access the PTSCONFIG utility:

1. Select *Start* > Run.
2. Type **cmd**. Press **Enter**.
3. Type **cd<space>../../**. Press **Enter**.
4. Type **cd<space>program<space>files/marquette/pts/<ApexPro Telemetry Server version>**. Press Enter.

   NOTE

   The current software version of the ApexPro Telemetry Server should replace **<ApexPro Telemetry Server version>** in this string.

5. Type **ptsconfig**. Press **Enter**.

PTSCONFIG Utility Commands

NOTE

Not all of the commands in the following table may apply to every type of ApexPro telemetry system.

display Commands

The commands listed below display ApexPro application information.

Command	Displays
help	Returns a list of available commands.
display<Space>tower	Displays ApexPro tower's full name "UNIT|NAME".
display<Space>software	Displays software versions for all running software (main, rack, etc.).
display<Space>build	Displays software build date/time.
display<Space>patient	Displays patient information: TTX, tower, and receiver numbers.
display<Space>patreceiver	Displays information about the patient' receiver and transmitter.
display<Space>IP	Displays IP address used by the ApexPro application to talk to the Unity Network.
display<Space>rack	Displays IP address used by the ApexPro application to talk to the telemetry system.
display<Space>receiver	Displays receiver/unit assignments for this ApexPro tower.

Command	Displays
display<Space>ttx	Displays network-wide in-use TTX list (from the TTX master list).
display<Space>unitlist	network-wide unit/receiver list (from the TTX master list).

modify Command

The commands listed below permit modifications to the ApexPro application.

Command	Modifies
modify<Space>unit	ApexPro tower's unit name.
modify<Space>tower	ApexPro tower's device name.
modify<Space>ip	IP address used by the ApexPro application to talk to the Unity Network.
modify<Space>rack	IP address used by the ApexPro application to talk to the telemetry system.
modify<Space>receiver	Receiver/unit assignments for this ApexPro tower.

NOTE

See "ptsconfig Modify Receiver Command" on page 3-29.

Other Commands

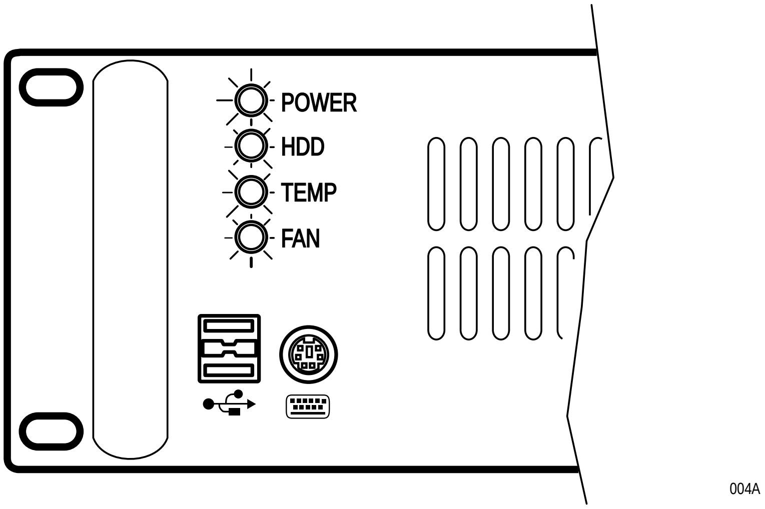
The table below lists other ApexPro software commands.

Command	Function
admit	Admits a patient on this ApexPro tower ("admit" shows usage).
discharge	Discharges a patient on this ApexPro tower ("discharge" shows usage).
dload	Downloads rack software ("dload" shows usage).
resetrack	Immediately (with no confirmation) resets all racks connected to the tower.
blink: ■ patient ■ rack ■ receiver ■ stop	Blinks rack LED(s) according to: ■ entered patient name (UNIT|BED) ■ entered ApexPro tower IP address ■ entered ApexPro tower IP address and receiver number ■ stop any blinking.
boot	Reboots the PC ("DDMM" password required: confirmation is also requested).

Command	Function
shutdown	Restarts ApexPro application ("DDMM" password required: confirmation is also requested).
statistics ■ waveform ■ wavereset ■ histogram ■ histreset	Displays ApexPro software performance statistics: ■ waveform data latency timing through ApexPro software. ■ reset waveform data latency timing counters. ■ waveform data timing through ApexPro software. ■ reset waveform data timing counters.
storeecg	Stores a file containing raw patient ECG sample data.

Indicators

LED Indicators



The LED indicators on the left side of the ApexPro Telemetry Server front panel serve to show system status, as described in the following table:

LED	Red	Green/Orange
POWER	Redundant power supply failure.	Normal
HDD	N/A	Indicates Hard Drive Access
TEMP	Indicates overheating above maximum allowable temperature.	Normal
FAN	Indicates cooling fan failure.	Normal

NOTE

Red LEDs indicate critical system conditions requiring immediate service attention. They are accompanied by an audible alarm buzzer. Refer to “Service Status Indicators” on page 5-13 for specific information associated with rectifying conditions indicated by red LED status indicators.

Webmin Indicators

The Webmin application provides many utilities for monitoring real-time ApexPro Telemetry Server settings, conditions and values. For procedures associated with Webmin feedback indicators refer to “Troubleshooting” on page 5-1.

Audible Alarms

WARNING

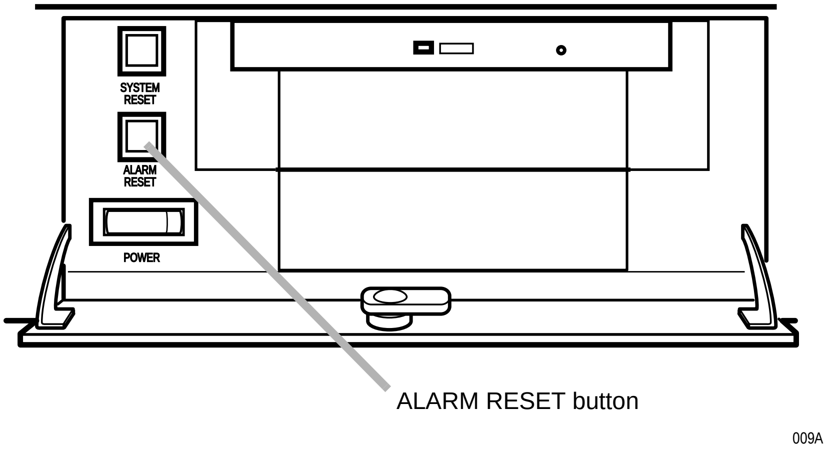
EQUPMENT FAILURE — Recurring audible alarms are a symptom of a serious system malfunction. Do not just reset the alarm when it occurs - also correct the problem causing the alarm. Equipment failure could result if the problem is not resolved.

NOTE

Audible alarms occur together with red LED status light activation. The red LEDs indicate which system-critical event is causing the alarm.

An audible alarm buzzer indicates critical system conditions requiring immediate service attention.

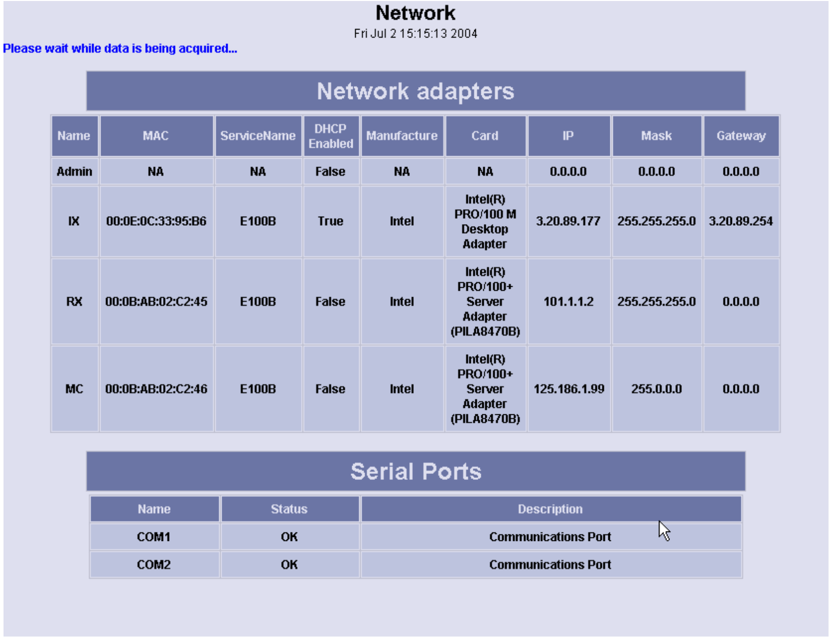
Audible alarms are silenced by pressing the **ALARM RESET** button, located behind a locking panel on right side of the ApexPro Telemetry Server front panel.



Refer to “Service Status Indicators” on page 5-13 for specific information associated with rectifying conditions indicated by an audible alarm.

Display Network Adapter/Serial Port Information

1. Access and log into the Webmin application according to "Webmin Logons" on page 2-21.
2. Click the *Diagnostics* tab.
3. Click the *Network* link.



Network

Fri Jul 2 15:15:13 2004

Please wait while data is being acquired...

Network adapters

Name	MAC	ServiceName	DHCP Enabled	Manufacture	Card	IP	Mask	Gateway
Admin	NA	NA	False	NA	NA	0.0.0.0	0.0.0.0	0.0.0.0
IX	00:0E:0C:33:95:B6	E100B	True	Intel	Intel(R) PRO/100 M Desktop Adapter	3.20.89.177	255.255.255.0	3.20.89.254
RX	00:0B:AB:02:C2:45	E100B	False	Intel	Intel(R) PRO/100+ Server Adapter (PILA8470B)	101.1.1.2	255.255.255.0	0.0.0.0
MC	00:0B:AB:02:C2:46	E100B	False	Intel	Intel(R) PRO/100+ Server Adapter (PILA8470B)	125.186.1.99	255.0.0.0	0.0.0.0

Serial Ports

Name	Status	Description
COM1	OK	Communications Port
COM2	OK	Communications Port

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3 Installation

For your notes

Pre-Installation Requirements

A site survey, along with all associated network upgrades and rack/mounting preparations must be completed prior to installation.

Site Survey

CAUTION
LOSS OF FUNCTION — Perform a pre-purchase site survey. Failure to perform a pre-purchase site survey may lead to improper performance of the ApexPro Telemetry Server and may effect the performance of the Unity Network as well.

The site survey must be performed by authorized GE Medical Systems *Information Technologies* personnel only.

Installation Requirements

Location

WARNING
SHOCK HAZARD — The ApexPro Telemetry Server must not be located in the patient vicinity as a shock hazard may exist, unless the medical electrical system standard, IEC 60950 is followed. The ApexPro Telemetry Server is UL 60950/IEC 60950 certified equipment which may not meet the leakage requirements of patient care area equipment.

The ApexPro Telemetry Server operates reliably within normal office environmental limits. Select a site that meets these criteria:

- Clean and reasonably free of excess dust.
- Well ventilated and away from sources of heat.
- Away from sources of vibration or physical shock.

The ApexPro Telemetry Server should NOT be installed in a patient care area. It should be installed and located with other IT equipment, such as a server rack or cabinet.

Physical Specifications

Refer to “Physical Specifications” on page A-5 for ApexPro Telemetry Server physical dimensions. Provide for these specifications when planning for installation.

Environmental Requirements

Refer to “Environmental Specifications” on page A-5 for ApexPro Telemetry Server environmental requirements. Provide for these environmental conditions when planning for installation.

Mounting

The ATS should be mounted in accordance with the site's design documentation and site survey results.

CAUTION
LOSS OF MONITORING — Mount the ApexPro Telemetry Server securely and away from vibration. Vibration may cause patient waveform dropout at the CIC Pro.

The ApexPro Telemetry Server can be installed free-standing, in a component rack, or in a wall bracket. The rack must be installed in a location providing proper environmental, ventilation, power, grounding, EMI/RF, and network requirements.

Ventilation

CAUTION
EQUIPMENT FAILURE — Do NOT locate the ApexPro Telemetry Server in an enclosed area that may restrict dissipation of generated heat. The ApexPro Telemetry Server uses an internal forced air cooling system. Any air flow restrictions may cause a rise in internal temperature which may result in equipment failure.

The ApexPro Telemetry Server is capable of producing heat and must be physically located to allow for ample air circulation to properly dissipate the heat.

Keep ApexPro Telemetry Server ventilation openings free of obstructions. The ApexPro Telemetry Server rack installation location should provide at least the following minimal clearances for ventilation and access.

In Front	15.5 centimeters (6 inches)
In Back	15.5 centimeters (6 inches)

EMI/RF Interference

The ApexPro Telemetry Server should be isolated from strong electromagnetic fields and electrical noise produced by electrical devices such as:

- Elevators
- Copy machines
- Air conditioners, large fans
- Large electric motors
- Radio and TV transmitters
- High frequency security devices
- High-load medical devices (e.g. imaging, defibrillators, etc.)

Power/Grounding Requirements

WARNINGS

SHOCK HAZARD — This equipment must not be located in the patient vicinity as a shock hazard may exist, unless the medical electrical system standard, IEC 60950 is followed. The ApexPro Telemetry Server is UL 60950/IEC 60950 certified equipment which may not meet the leakage requirements of patient care area equipment. Electrical shock could result from not following this instruction.

EQUIPMENT FAILURE — Provide adequate cooling ventilation for the ApexPro Telemetry Server. Failure to adequately ventilate the ApexPro Telemetry Server may cause equipment failure or improper operating conditions which may endanger the patients being monitored.

Power

GE Medical Systems *Information Technologies* requires the use of a UPS device with the ApexPro Telemetry Server, otherwise, improper shut down of the unit could result from a power outage.

Connect only the ApexPro Telemetry Server power cord to the UPS. Do NOT connect any other devices to the UPS. Connecting other devices may shorten UPS run times.

A properly grounded duplex wall receptacle should be provided for the UPS. The wall receptacle must be installed in an approved junction box. Use only a 3-prong, polarized, medical-grade wall receptacle to accept the UPS 3-prong polarized power cord plug.

Receptacle wiring must satisfy all applicable IEC and UL specifications, applicable building codes, and local electrical inspection regulations. For international wall receptacles, wiring must comply with all internal standards agencies within the specific country. The overall system AC current load on the branch circuit supplying power to the UPS must not exceed 80% of the AC current rating for the circuit.

UPS Run Time Estimates

CAUTION

Connect the UPS to the ApexPro Telemetry Server(s) only. Do NOT connect printers or other devices to the UPS, as such devices may shorten estimated run-times. If AC line power is not restored before UPS run-time is exceeded, the ApexPro Telemetry Server shuts down and patients will not be monitored.

UPS run-times are affected by:

- Battery age,
- Ambient temperature,
- Site specific UPS usage patterns, and
- Load characteristics.

Your actual run times may be different.

UPS Description	Runtime Estimates
Power Supply UPS 600VA 120 Volts	1 ApexPro Telemetry Server for approximately 40 minutes 2 ApexPro Telemetry Server for approximately 15 minutes
Power Supply UPS 600VA 220 Volts	1 ApexPro Telemetry Server for approximately 42 minutes 2 ApexPro Telemetry Server for approximately 14 minutes
Power Supply UPS 750VA 120 Volts	1 ApexPro Telemetry Server for approximately 48 minutes 3 ApexPro Telemetry Server for approximately 11 minutes
Power Supply UPS 750VA 220 Volts	1 ApexPro Telemetry Server for approximately 41 minutes 3 ApexPro Telemetry Server for approximately 10 minutes
Power Supply UPS 2000VA 120 Volts	1 ApexPro Telemetry Server for approximately 1 hour, 22 minutes 5 ApexPro Telemetry Server for approximately 9 minutes

Refer to “Optional Components” on page 6-3 for UPS part number information.

Grounding

To ensure safety and for proper operation, the ApexPro Telemetry Server must be properly grounded in accordance with all applicable IEC and UL specifications, applicable building codes, and local electrical inspection regulations. For international installations, grounding must comply with all internal standards agencies within the specific country.

The common ground point for wall receptacles should be connected to the nearest equipotential ground through a bonded grounding system. If a bonded grounding system is not available, the ground pin of each wall receptacle must be individually connected (using 10 AWG stranded copper grounding cable) to a central grounding point. Do NOT jumper the ground pins of the receptacles together.

The grounding system must not carry current, such as a grounded neutral, since the current flow could produce potential differences along the ground path. Potential differences are a shock hazard source for equipment users and patients. All grounded objects in the installation area must be at the same ground potential.

Router

A router allows connection between the hospital network and the Unity Network IX network. The router is used mainly for remote services connections. For further details refer to the Unity Router Configuration Document (2023994-001).

Routers may not be required for all ApexPro Telemetry Server installations. Refer to the site survey.

Network Requirements

Category 5 100Base-T network drop cables with RJ-45 connectors are required for the following Unity Network connections.

- Unity Network IX network
- Unity Network MC network
- Unity Network RX network

ApexPro Telemetry Server Installation/Configuration

WARNINGS

LOSS OF ALARMS/DATA — Use the ApexPro Telemetry Server with ApexPro V3.5 ONLY with CIC Pros running ApexPro V3.3. ATS V3.5 is backward-compatible with ApexPro V3.3 ONLY Other previous versions of ApexPro are NOT compatible with ATS V3.5. In-unit compatible sharing of the same care unit names between ATS and ApexPro devices having incompatible software versions can result in lost or corrupted telemetry alarm defaults data and loss of audible alarms.

LOSS OF FUNCTION/EQUIPMENT FAILURE — Only external devices specifically designed to be connected to the ApexPro Telemetry Server, or approved by GE Medical Systems *Information Technologies* for use with the ApexPro Telemetry Server, should be connected, as specified in this manual or as otherwise specified by the manufacturer. Loss of telemetry function or equipment failure could result if this instruction is not followed.

SHOCK HAZARD — Connect only approved devices to the ApexPro Telemetry Server according to the instructions in this manual. A shock hazard may exist if external devices are connected differently from described in this manual, or as directed by the manufacturer.

EQUIPMENT FAILURE — External equipment must be connected to the Pro ApexPro Telemetry Server only by qualified biomedical engineering personnel. Loss of telemetry function or equipment failure could result if this instruction is not followed.

CAUTIONS

LOSS OF FUNCTION — All external cabling used with the ApexPro Telemetry Server must be routed so as not to interfere with access or operation of the system.

TRIPPING HAZARD/LOSS OF FUNCTION — All cabling must be installed to protect against tripping and accidental disconnection of the cables.

ELECTROSTATIC DAMAGE — The ApexPro Telemetry Server is static sensitive and should be handled using precautions to prevent electrostatic discharge damage. Equipment failure could result if this instruction is not followed.

Mounting

CAUTION

LOSS OF MONITORING — Mount the Receiver System securely and away from vibration. Vibration may cause patient waveform dropout at the CIC Pro.

The mounting options for the ApexPro Telemetry Server are:

- Floor/tabletop
- Rack mount
- Wall bracket mount

Before Mounting Units on Non-Standard TCP/IP Networks

Standard Unity Network IX network TCP/IP settings conform to the following scheme:

- IP Address: 192.168.x.x
- Subnet Mask: 255.255.0.0

NOTE

The default specific settings for the Unity Network IX network port are printed on a label attached to the ApexPro Telemetry Server cover.

Non-standard networks, or conflicting network device identification/configuration may prevent remote connection. In such cases, default ApexPro Telemetry Server IP address settings must be re-configured to conform to the appropriate TCP/IP settings BEFORE the ApexPro Telemetry Server is physically mounted.

Refer to the site survey to determine of non-standard TCP/IP settings are required for the ApexPro Telemetry Server installation.

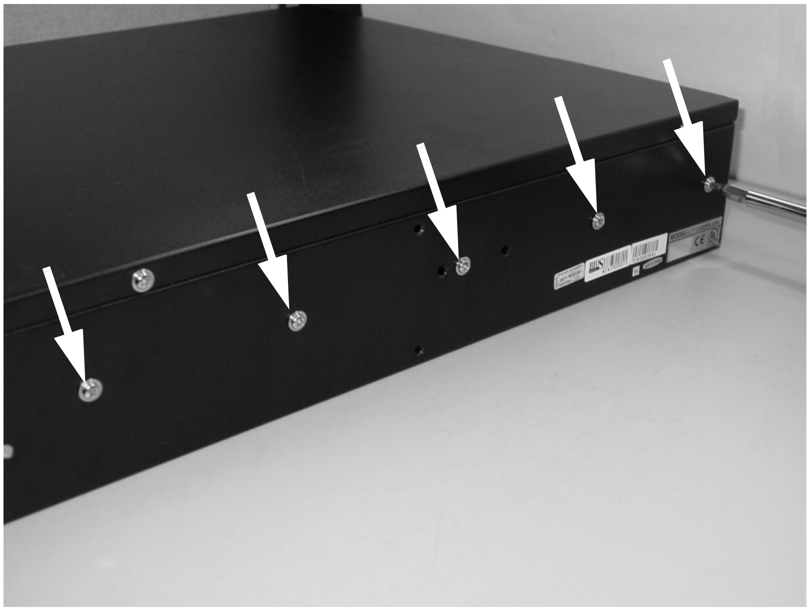
If non-standard TCP/IP setting ARE required:

1. Connect a service laptop directly with the ApexPro Telemetry Server via either the ApexPro Telemetry Server Unity Network IX network ethernet port, or via a serial cable connection.
    a. If a connection to the ApexPro Telemetry Server Unity Network IX network ethernet port is used, configure a service laptop for direct ethernet connection with the ApexPro Telemetry Server according to “Service Laptop Direct Connection” on page B-3.
    b. If a serial connection to the ApexPro Telemetry Server is used, connect according to “Serial Connection” on page 5-4.
2. Start-up the ApexPro Telemetry Server according to “Power up” on page 3-20.
3. Configure the ApexPro Telemetry Server Unity Network IX network IP address settings according to “IP Address Configuration” on page 3-22.

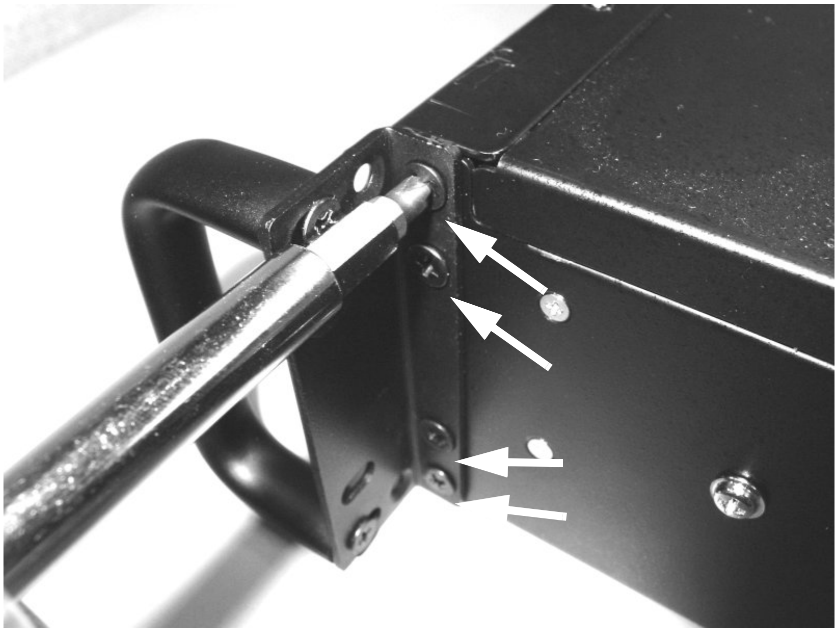
4. Shut down the ApexPro Telemetry Server (see “Stop/Start/Restart ApexPro Telemetry Server” on page 2-29), and proceed with ApexPro Telemetry Server installation.

Floor/Tabletop Mounting

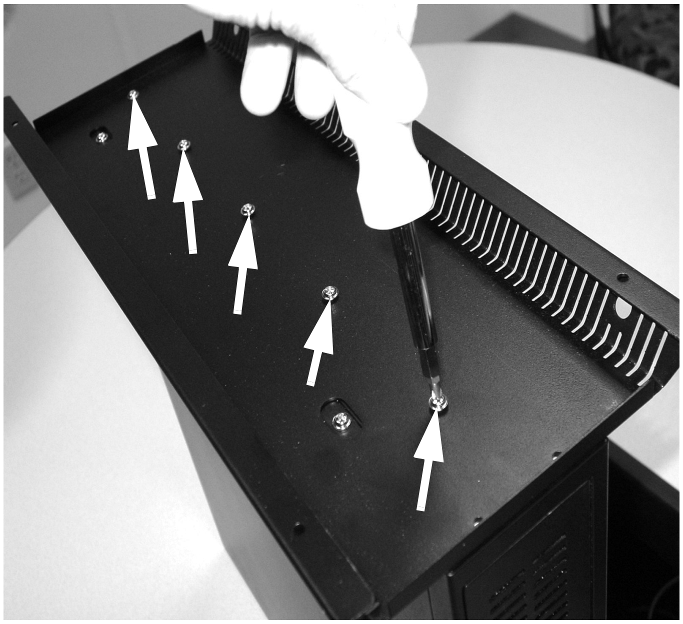
1. Remove the 5 center screws from the right side of the ApexPro Telemetry Server.



2. Remove the screws and/or the handle at the front right side of the ApexPro Telemetry Server.



3. Place the ApexPro Telemetry Server on its left side on a sturdy surface. Position the stand so the holes in the stand align with the screw holes in the right side of the ApexPro Telemetry Server. Secure the stand with the 5 screws removed in step 1.



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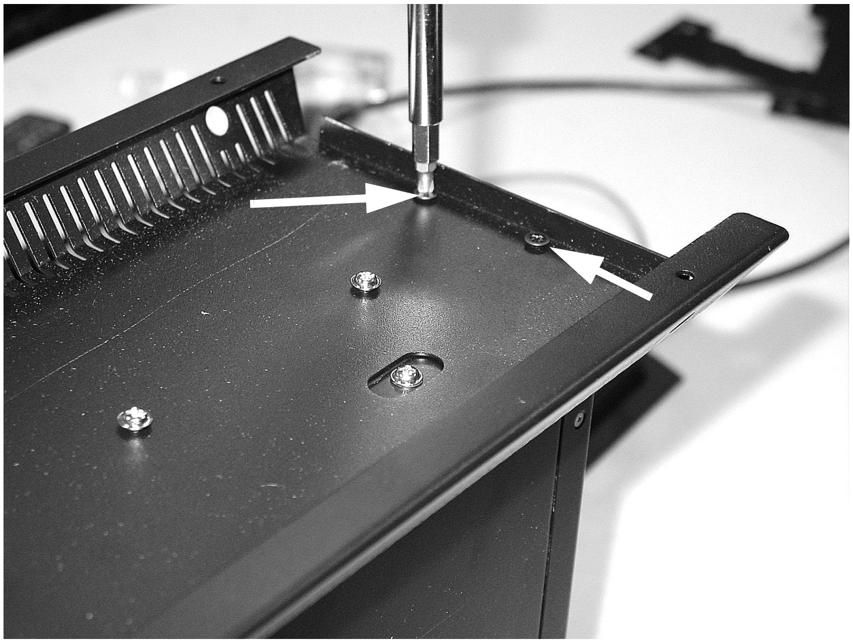
4. Finish securing the stand with the 2 front right side screws removed with the handle in step 3.



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Rack Mounting

WARNING
PERSONAL INJURY/EQUIPMENT DAMAGE — If the ApexPro Telemetry Server will be installed in a rack, observe the following guidelines associated with rack stability:

- Ensure both the top and bottom of the rack are securely fastened to a suitable and substantial building support.
- Ensure the rack weight is supported by the leveling jacks and that the rack leveling jacks are in contact with the floor.
- If it is a single rack installation, ensure stabilizers are attached.
- If it is a multiple rack installation, ensure the racks are tightly secured together.
- Do not extend more than one component outside the rack at a time.
- Do not exceed the rack manufacturer's maximum load carrying capacity specification.

Personal injury or equipment failure could result from not following these instructions.

CAUTION
PERSONAL INJURY/EQUIPMENT DAMAGE — When using the center position, it is important to secure the side mounting brackets as close to the ApexPro Telemetry Server center-of-balance as possible. Installing the brackets off-balance-center could cause the ApexPro Telemetry Server to interfere with other servers in the rack or failure of the installation brackets.

There are 3 different rack mounting options:

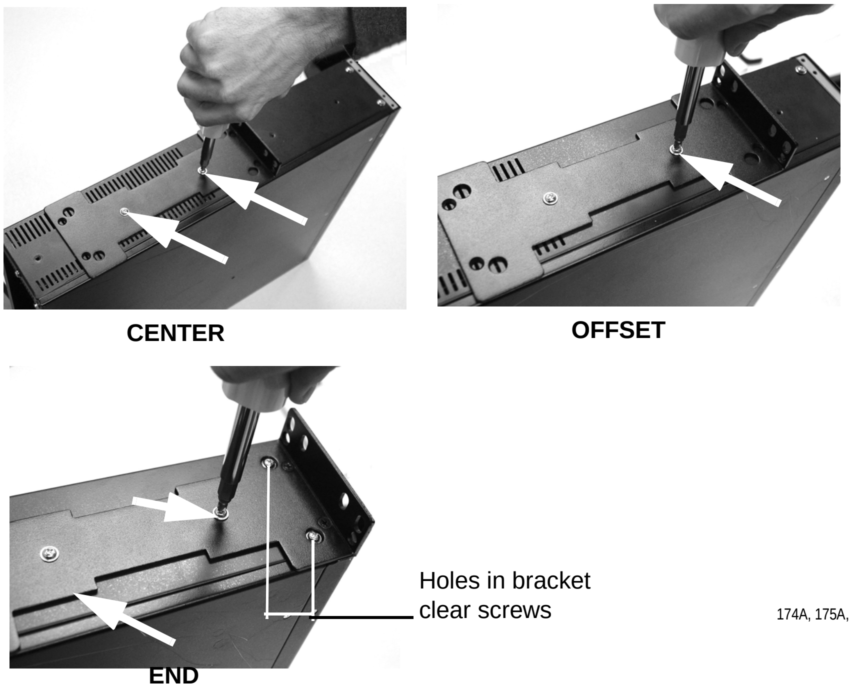
- Side mounting
- Shelf mounting
- Rail mounting

Rack Side Mounting

CAUTION
LIFTING HAZARD — Rack mounting the ApexPro Telemetry Server in the center position is a two-person job. Do not attempt to install the ApexPro Telemetry Server in a rack without help. One person needs to hold/align the ApexPro Telemetry Server in the rack while another person secures it in place.

The side mounting brackets are designed to be used in three locations along the sides of the ApexPro Telemetry Server: end, center, and offset. Choice of mounting option is determined by rack requirements.

1. Select a position in the rack for the ApexPro Telemetry Server, according to rack needs: end, center, and offset.
2. Remove the screws from the center sides of the ApexPro Telemetry Server, required for the specific installation.
3. Position the side brackets so the holes in the brackets align with the center side holes in the ApexPro Telemetry Server as required for the installation.



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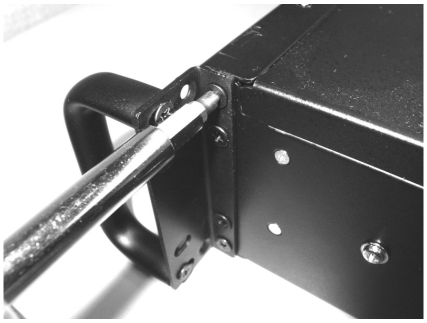
4. Secure the side brackets to the ApexPro Telemetry Server with the screws removed in step 2.
5. For the different rack mounting options:
   a. If you are using either the end, or offset rack mounting option, install the shelf mount according to “Rack Shelf Mounting” on page 3-16, to support the off-balanced weight of the ApexPro Telemetry Server.

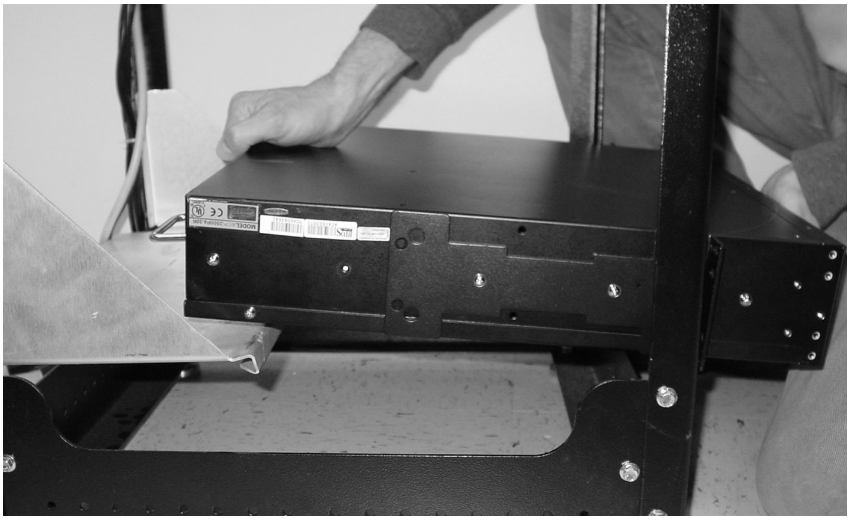
NOTE

The brackets used for handle installation can be used instead of the side brackets for the end rack mounting option.



157A

b. For end, or offset rack mounting options, position the ApexPro Telemetry Server with the back resting on the shelf installed in the previous step.



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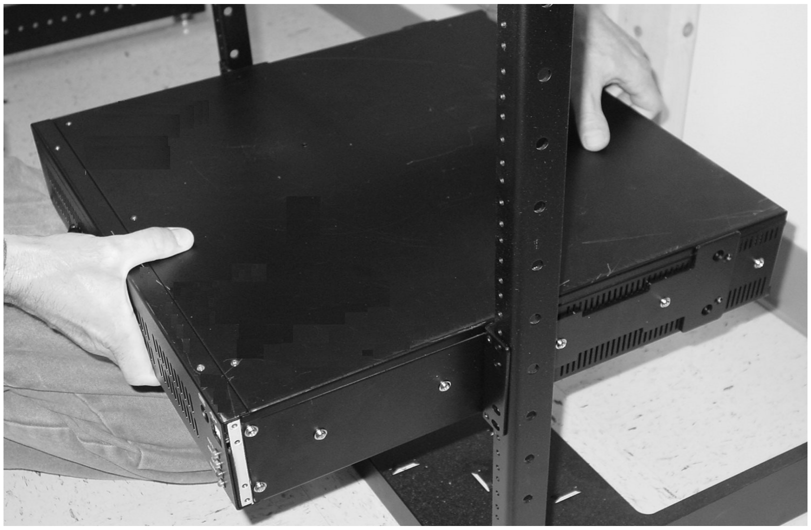
c. For the center rack mounting option, have a second person assist by holding the ApexPro Telemetry Server in position in the rack while it is being secured. Align the flanges on the installation brackets with the rack rails. Make sure the ApexPro Telemetry Server is level.



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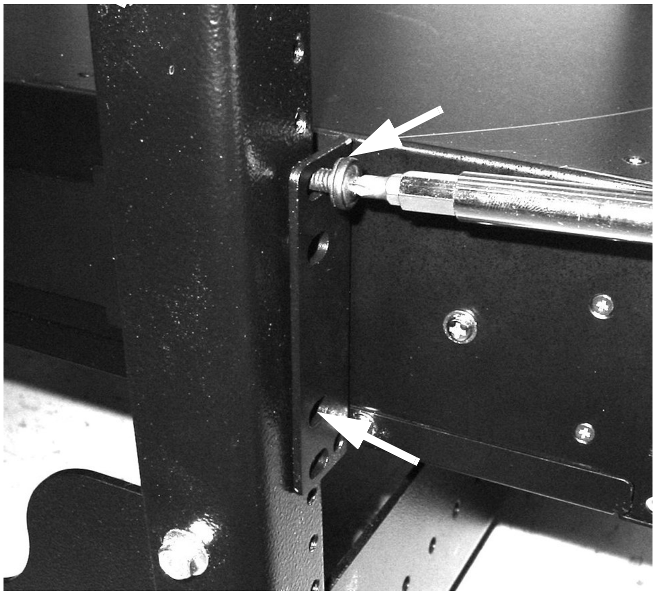
6. Secure the side brackets/ApexPro Telemetry Server in the rack with 4 rack rail screws.



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Rack Shelf Mounting

NOTE

ApexPro Telemetry Server shelf-mounting requires a 4-post rack. The ApexPro Telemetry Server must rest level when it is secured at the front rack posts, and rests on the shelf at the back.

1. Determine a position in the rack for the ApexPro Telemetry Server shelf. The shelf should be installed on the back rails.
2. Position the shelf as determined in the previous step.

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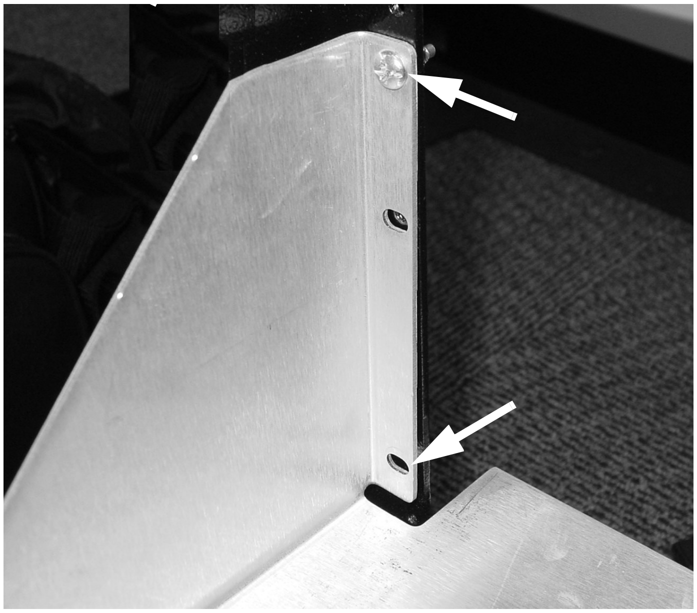
3. Secure the shelf to the back rack rails with 4 rack rail screws.



4. Position the ApexPro Telemetry Server in place in the rack so it rests on the shelf. If you are using the center, or end rack installation options, return to "Rack Side Mounting" on page 3-13 and complete the installation from step b, page 3-15.

Rack Rail-Mounting

CAUTION

LIFTING HAZARD — Rail-mounting the ApexPro Telemetry Server in a rack is a two-person job. Do not attempt to install the ApexPro Telemetry Server in a rack without help. One person needs to hold/align the ApexPro Telemetry Server in the rack while another person secures it in place

The ApexPro Telemetry Server weighs approximately 30 lbs (14 kg. Use proper lifting techniques when positioning the ApexPro Telemetry Server in the rack during installation to avoid back injuries.

NOTE

ApexPro Telemetry Server rail-mounting requires a 4-post rack.

1. Remove the 10 screws in the center of both sides of the ApexPro Telemetry Server.
2. Align the holes in the rack rails with the screw holes in the side of the ApexPro Telemetry Server. Secure the rack rails to the ApexPro Telemetry Server with the screws removed in step 1.
3. Select a position in the rack for the ApexPro Telemetry Server.

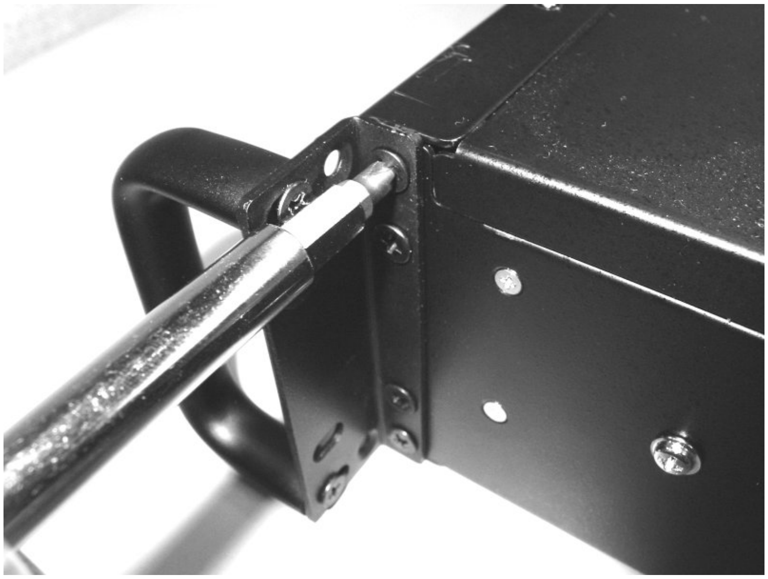
4. With another person assisting you, position the ApexPro Telemetry Server in place in the rack. Secure the rails/ApexPro Telemetry Server to the rack with 4 rack rail screws.

Wall Mounting

WARNING

PERSONAL INJURY/EQUIPMENT FAILURE — Provide proper mounting support for the wall mount. Hardware securing the wall mount to the wall MUST extend through the wallboard into underlying wooden wall studs, aluminum studs, concrete or other solid wall material (with the use of appropriate anchors). Lag screws screwed only into drywall, plywood, or particleboard is NOT acceptable. If movement of the wall mount to line up with wall studs is not possible, then 2x6 boards should be used to span the studs. Failure of the ApexPro Telemetry Server wall mount support could result in personal injury and/or equipment failure.

1. Determine the wall location for the ApexPro Telemetry Server installation. The wall mount holes MUST align with wall studs, or a suitable reinforcing structure, to support the weight of the ApexPro Telemetry Server and mount.
2. Mark the locations for the wall mount screws. Drill pilot holes for the screws into the underlying wall studs.
3. Secure the wall mount through the wall board and into suitable support material with 4 of the largest lag screws that will fit into the holes in the wall mount.
4. If not already installed, secure the brackets used for handle installation to the front sides of the ApexPro Telemetry Server.



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5. Secure the ApexPro Telemetry Server into the wall mount with 4 rack rail screws.

Connections

CAUTION
EQUIPMENT FAILURE — Unity Network MC, IX and RX network connections must be made in order to successfully power up the ApexPro Telemetry Server.

All the following connections are ethernet-based, and require a RJ-45 parallel cable connection.

NOTE
ApexPro Telemetry Server ping functionality on the Unity Network IX network is disabled when the firewall is enabled. See “ATS Control Center” on page 2-27.

Unity Network MC Network Connection

Connect the Unity Network MC network drop cable RJ-45 to the Unity Network MC network port on the back of the ApexPro Telemetry Server.

Unity Network IX Network Connection

Connect the Unity Network IX network drop cable to the Unity Network IX network port on the back of the ApexPro Telemetry Server.

Unity Network RX Network Connection

Connect the ApexPro Telemetry Server Unity Network RX network ethernet port to the ApexPro receiver subsystem ethernet port as indicated above.

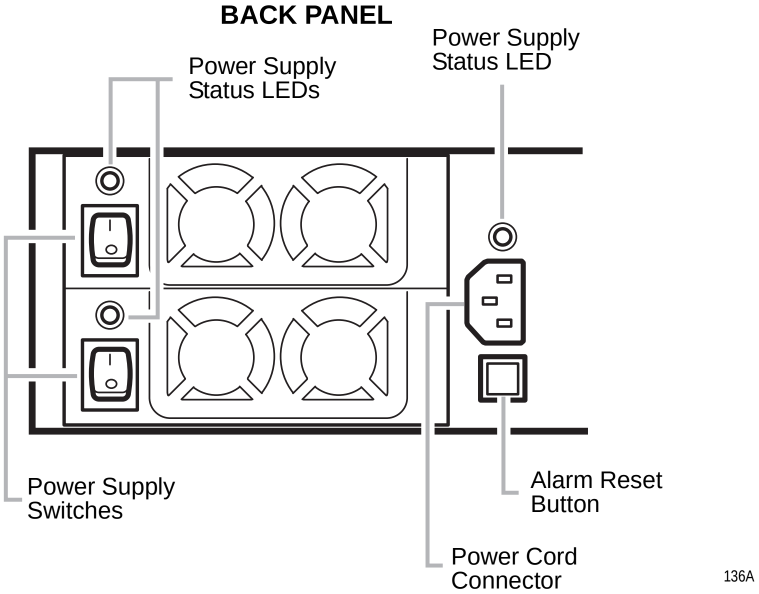
- The ApexPro Telemetry Server requires a dedicated connection to the ApexPro receiver subsystem.
- If the distance between the ApexPro Telemetry Server and the ApexPro Receiver Subsystem is less than 100 meters (328 ft.), connect the devices point-to-point with a crossover cable (null modem) connection.
- If the distance is greater than 100 meters (328 ft.), use either an additional hub or use a fiber optic cable.

Power up

NOTE

ApexPro Telemetry Server power supplies automatically adjust to input power sources within the specified limits. See "Technical Specifications" on page A-3.

1. Plug the power cord into the power cord receptacle in back of the ApexPro Telemetry Server.


BACK PANEL
Power Supply Status LEDs
Power Supply Status LED
Power Supply Switches
Alarm Reset Button
Power Cord Connector
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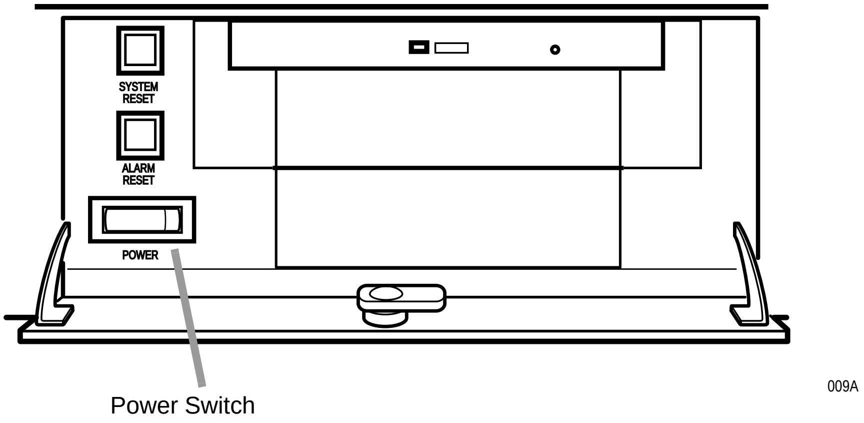
2. Plug the 3-pronged ApexPro Telemetry Server power cord into an approved activated UPS device.
3. Switch both ApexPro Telemetry Server power supply switches on. The power supply status LEDs are green when the power supplies are properly activated.
4. Press and momentarily hold the power switch on the front of the ApexPro Telemetry Server. The ApexPro Telemetry Server starts up in normal user mode.

   NOTE

   To interrupt the normal startup procedure and log into the ApexPro Telemetry Server as a different user, hold down the Shift key during startup.

FRONT PANEL

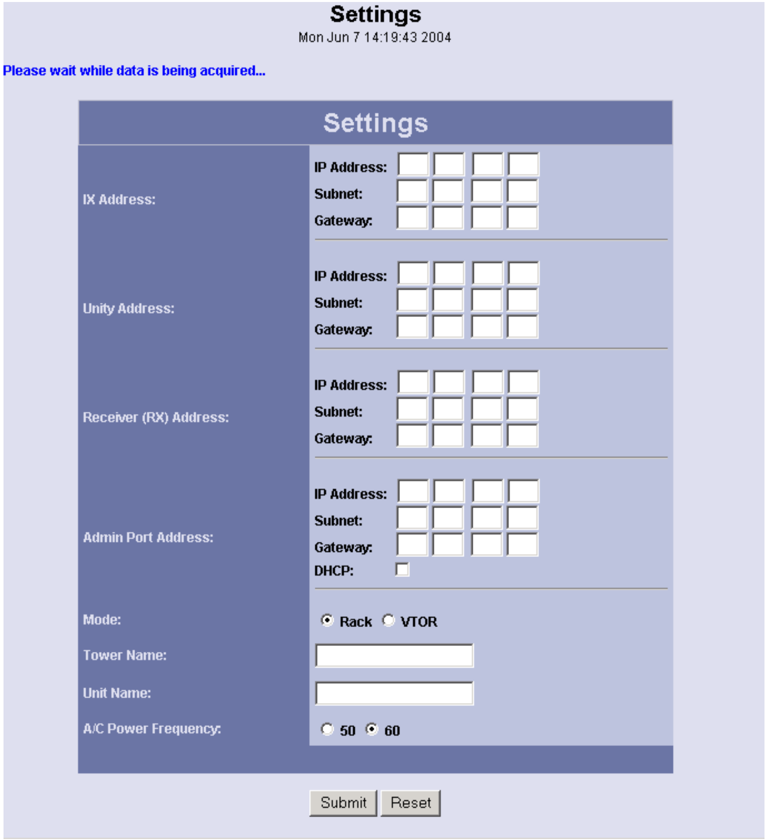

SYSTEM RESET
ALARM RESET
POWER
009A
Power Switch

5. The ApexPro Telemetry Server beeps three times when startup is complete.

IP Address Configuration

WARNING
LOSS OF MONITORING/DATA — Be extremely careful not to assign the same IP address to two different devices. Duplicate IP addresses will cause erratic system communication and data loss.

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Configuration* tab.
3. Click the *Settings* link.
4. Enter the Unity Network IX network IP address, subnet mask and default gateway settings in the *IX Address IP Address*, *Subnet* and *Gateway* fields.



Settings
Mon Jun 7 14:19:43 2004

Please wait while data is being acquired...

Settings

IX Address:	IP Address: Subnet: Gateway:
Unity Address:	IP Address: Subnet: Gateway:
Receiver (RX) Address:	IP Address: Subnet: Gateway:
Admin Port Address:	IP Address: Subnet: Gateway: DHCP: ☐
Mode:	● Rack ○ VTOR
Tower Name:	
Unit Name:	
A/C Power Frequency:	○ 50 ● 60

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5. Enter the Unity Network MC network IP address, subnet mask and default gateway settings in the *Unity Address IP Address*, *Subnet* and *Gateway* fields.

6. Enter the Unity Network RX network IP address, subnet mask and default gateway settings in the *Receiver (RX) Address IP Address*, *Subnet* and *Gateway* fields.
7. Set the *Administration Port Address* configuration by completing one of the following options:
   - To set a fixed IP address for the administration port, enter the administrator Port IP address, subnet mask and default gateway settings in the *Admin Port Address IP Address*, *Subnet* and *Gateway* fields.
   - To have the administration port IP address dynamically allocated when the ApexPro Telemetry Server starts up, select the *DHCP* checkbox.
8. Click *Submit*.
9. For the new IP Address settings to take effect, restart the ApexPro Telemetry Server according to “Stop/Start/Restart ApexPro Telemetry Server” on page 2-29.

Remote Services Configuration

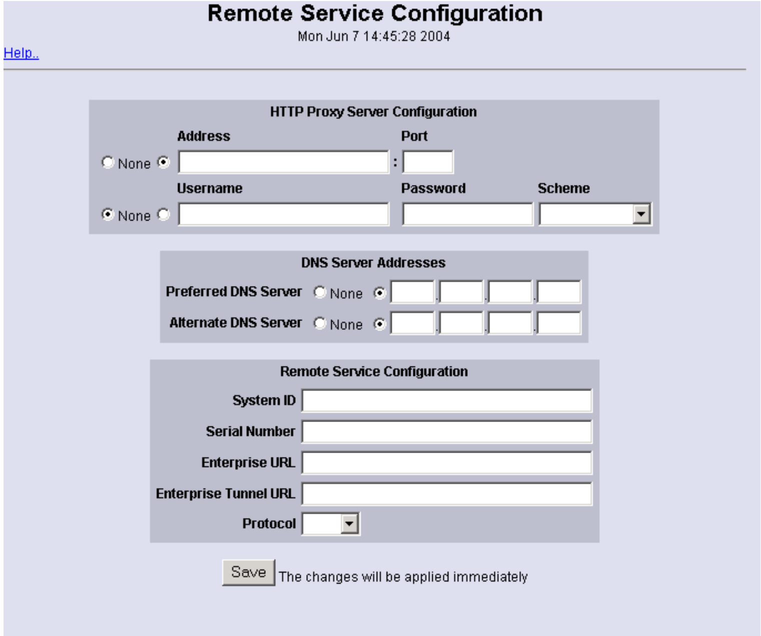
Remote Services is used to configure remote connection parameters.

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Configuration* tab.
3. Click the *Remote Services* link under the *Configuration* menu along the left side of the window. The *Remote Services* link expands into two choices: *Configuration* and *Control*.

Configuration

The *Configure* link is used to display/configure remote services settings.

1. Click the *Configuration* link under the *Remote Services* menu.
2. View/configure settings as required.


Remote Service Configuration
Mon Jun 7 14:45:28 2004
Help..
HTTP Proxy Server Configuration
Address
Port
○ None ●
Username
Password
Scheme
● None ○
DNS Server Addresses
Preferred DNS Server ○ None ●
Alternate DNS Server ○ None ●
Remote Service Configuration
System ID
Serial Number
Enterprise URL
Enterprise Tunnel URL
Protocol
Save
The changes will be applied immediately

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NOTE

Remove Service Configuration settings are automatically populated.

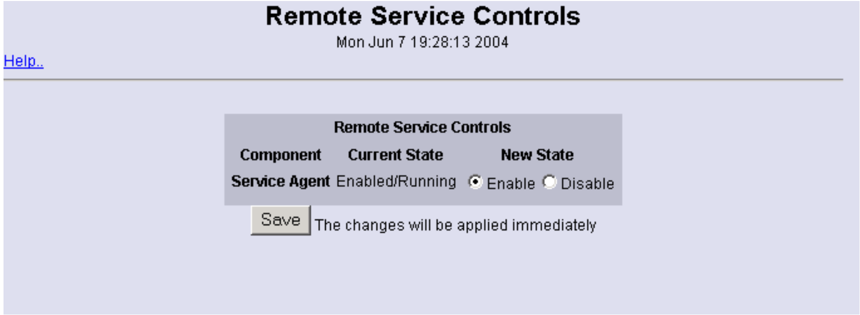
Parameter	Value	Notes
HTTP Proxy Server Configuration		
Address	Installation site proxy server IP address.	Value determined during site survey. Refer to site survey workbook.
Port	Installation site proxy server port number.	Value determined during site survey. Refer to site survey workbook.
Username/Password	Enter Username/ Password required as required for authentication.	Value determined during site survey. Refer to site survey workbook.
Scheme	Select the correct scheme from the drop-down list. The drop-down list schemes are *Basic*, *Digest* and *NTLM.*	Value determined during site survey. Refer to site survey workbook.
DNS Server IP Addresses		
Preferred DNS Server	Displays installation site preferred DNS server IP address (optional).	Value determined during site survey. Refer to site survey workbook.
Alternate DNS Server	Displays installation site alternate DNS server IP address (optional).	Value determined during site survey. Refer to site survey workbook.
Remote Service Configuration		
System ID	Identifies system to remote service.	Read-only value.
Serial Number	Set during manufacturing.	Read-only value.
Enterprise URL	If required, enter back office URL for remote services back office.	Need to change only if back office server changes, or if NOT using DNS.
Enterprise Tunnel URL	If required, enter back office tunnel URL remote services back office.	Need to change only if back office server changes, or if NOT using DNS.

3. Click *Save* to apply configuration setting changes.

Start Remote Services

The ApexPro Telemetry Server is factory configured with remote services disabled.

1. Click the *Control* link under the *Remote Services* menu.
2. Select the *Service Agent Enable* radio button.



Remote Service Controls

Mon Jun 7 19:28:13 2004

Remote Service Controls

Component	Current State	New State
Service Agent	Enabled/Running	● Enable ○ Disable

The changes will be applied immediately

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3. Click *Save* to apply control setting changes.

Remote Services Startup Verification

Check for any system log entries indicating a remote services startup failure. View logs according to“View Logs” on page 5-20.

Contact Remote Services Back Office

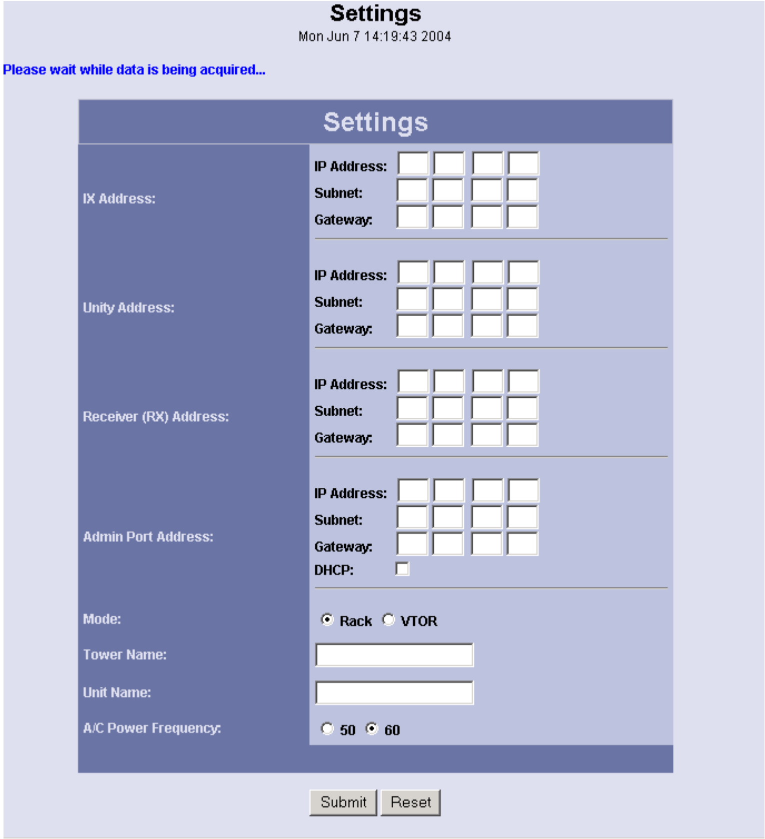
Contact the remote services back office. They should test the connection between the ApexPro Telemetry Server and the back office.

Setting the Telemetry System Type

NOTE

If applicable, see the separate service or configuration documentation for your specific ApexPro installation for more, or different, ApexPro configuration information associated with your specific telemetry system.

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Configuration* tab.
3. Click the *Settings* link.
4. Select the appropriate *Mode* radio button for your ApexPro telemetry system. Refer to the configuration information for your specific ApexPro installation.



Settings

Mon Jun 7 14:19:43 2004

Please wait while data is being acquired...

Mode: ● Rack ○ VTOR

A/C Power Frequency: ○ 50 ● 60

Settings
IX Address:
Unity Address:
Receiver (RX) Address:
Admin Port Address:
IP Address:
Subnet:
Gateway:
DHCP: ☐
Tower Name:
Unit Name:
Submit
Reset

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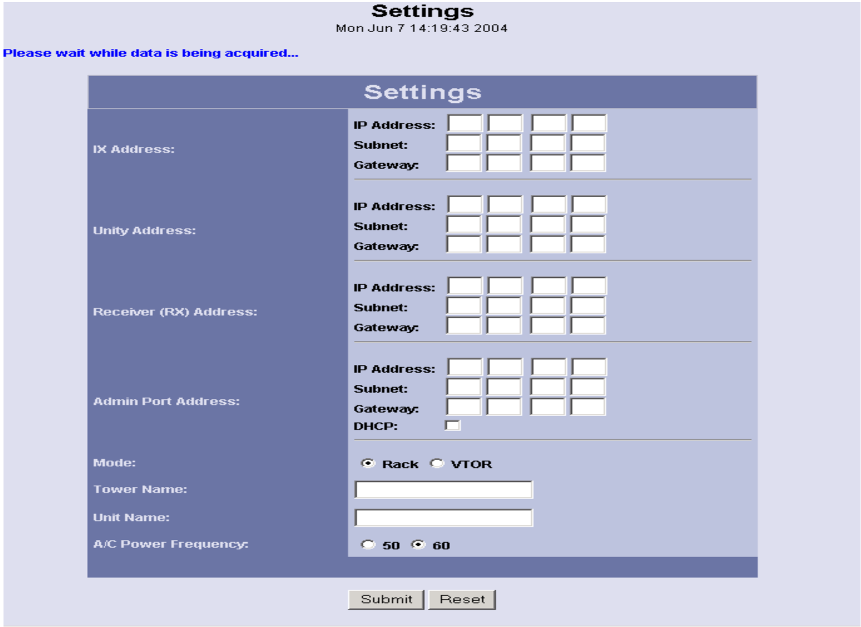
5. Click *Submit*.

Setting the ApexPro Telemetry Server Tower and Unit Name

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Configuration* tab.
3. Click the *Settings* link.
4. Enter a name for the ApexPro Telemetry Server tower into the *Tower Name* field.


Settings
Mon Jun 7 14:19:43 2004
Please wait while data is being acquired...
Mode: ● Rack ○ VTOR
A/C Power Frequency: ○ 50 ● 60
Settings
IX Address:
Unity Address:
Receiver (RX) Address:
Admin Port Address:
IP Address:
Subnet:
Gateway:
DHCP:
Tower Name:
Unit Name:
Submit
Reset

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5. Enter a name for the ApexPro Telemetry Server unit into the *Unit Name* field.
6. Click *Submit*.

ptsconfig Modify Receiver Command

NOTE

Read "ApexPro Receiver Configuration" on page 2-13 before using the *modify receiver* command.

The *modify receiver* command is used to maintain the receiver configuration list on ApexPro towers. See "ApexPro Receiver Configuration" on page 2-13 for a detailed description of ApexPro receiver configuration concepts.

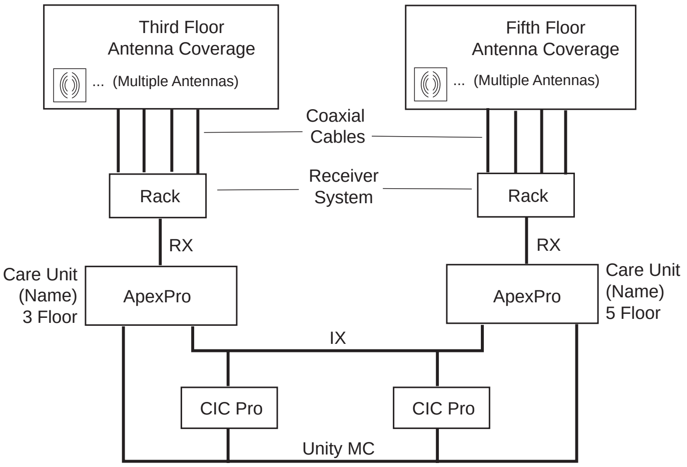
The configuration list indicates how many receivers are reserved for specific units. The list also indicates whether specific units can admit to unassigned receivers (this is a yes-no switch-type item entered for each unit name in the list). Units can have both reserved receivers and access to unassigned receivers

If a unit's use-unassigned-receivers flag is yes, admits to the unit can use all explicitly assigned receivers, as well as any discharged, unassigned receivers. If a unit's use-unassigned-receivers flag is no, the unit can only use the number of receivers allocated for it, and no more.

It is possible for a unit to have reserved receiver count of zero. A unit with a reserved receiver count of zero would have no receivers explicitly assigned to it. In this case, the unit's use-unassigned-receivers flag must be yes or the unit would not be able to admit to the tower. With this in mind, if no receivers need to be allocated to specific units, all units entered in the list can have their reserved-receiver counts set to zero, and their use-unassigned-receivers flag set to yes.

If the list of unit names and their count of reserved receivers is empty (i.e., no unit names are entered), the ApexPro tower accepts admits from any unit. However, if even one unit name is entered, then ALL unit names needing access to the tower must be entered.

For example, a receiver rack containing 16 receivers is configured with 4 In some instances, it is necessary to assign receivers to particular care units. For example, a receiver system (rack) connected to a separate antenna system is installed, and only one Unity Network MC network ties all the CIC Pro/ApexPro systems together. The ptsconfig command modify receiver is used to associate specific care units to specific racks.



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The modify receiver command allows:

- segmenting of receiver/antenna systems, and specific assignment of care units to those systems.
- a specific number of receivers to be assigned to specific care units. This explicitly dictates exactly which receiver racks, and how many receivers in those racks, can be assigned to a given care unit.
- configuration to allow specific care units access to unassigned receivers With this setting enabled (Y), the specified care unit can use any number of available receivers in the specified receiver rack, regardless of how many receivers have been explicitly assigned to that care unit.

When using the modify receiver command, all other care units that could utilize the remaining unassigned receivers in a rack should be added to the receiver list (modify receiver command). If this is not done, available unassigned receivers will not be used.

For example, a receiver rack containing 16 receivers is configured with 4 receivers explicitly assigned to the 3Floor care unit. The unassigned receivers setting is enabled (Y) for the 3Floor care unit. In this configuration, the 3Floor care unit can use all 16 receivers available in the rack.

If other care units need access to unassigned receivers in the rack, those care units must also be added to the receiver list, explicitly assigned a certain number of receivers, and configured to either use, or be restricted from using, unassigned receivers (Use unassigned receivers? Y/N>).

1. If necessary, start the PTSCONFIG utility according to instructions in “ApexPro PTSCONFIG Utility” on page 2-35.
2. Type **modify receiver** and press **Enter**.
3. Press **Ctrl +]** to exit out of ptsconfig then close the MS–DOS window by typing **exit** at the prompt.

Language Configuration

The default ApexPro Telemetry Server language is English, and is set during manufacturing. Perform the following procedure to change the ApexPro Telemetry Server application language, if required.

NOTE
This procedure requires a VNC connection. See “VNC Logon” on page 2-20.

1. From the ApexPro Telemetry Server desktop, select *Start* > *Run* and type **cmd**. Verify the Windows command prompt window opens and the title bar is blue, indicating it is active. If not, click inside the command prompt window.
2. Log off the cic user account and log in as username: **cicadm**; password: **cicadm1,3,5,7**.
3. Type **cd ../..** and press **Enter**.
4. Type **cd<space>program<space>files\marquette\ats\pts_0001** and press **Enter**.
5. Type **gepts_ats_sys<space>-lang=[Language Code]** and press **Enter**.

   NOTE

   [Language Code] is the two letter code for the language the ApexPro Telemetry Server will be configured to use (Example: **gepts_ats_sys -lang=en** would configure the ApexPro Telemetry Server to use English). Choose from the following:

Language Code	Language
en	English
es	Spanish
no	Norwegian
ru	Russian
hu	Hungarian
sv	Swedish
fr	French
de	German
it	Italian
nl	Dutch
da	Danish
pt	Portuguese
pl	Polish

6. If the language configuration was successful, the message *Success set to [Language Code]* will display in the command prompt window.
7. Restart the ApexPro Telemetry Server enable the new language configuration. See “Stop/Start/Restart ApexPro Telemetry Server” on page 2-29.
8. Log in as user: **cicadm**; password: **cicadm1,3,5,7**.

   NOTE

   This step will add the new configuration settings to the registry.

9. Log off the *cicadm* account and log in as cic user.

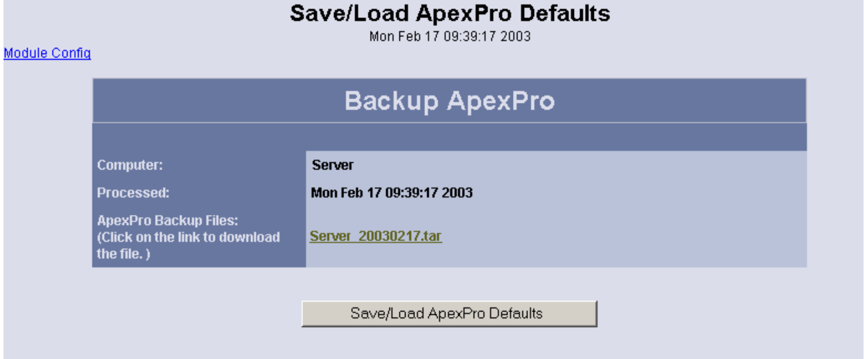
Completion

Save/Load Defaults

Save/Load Defaults is used to back up/restore system defaults for archive and disaster recovery. The defaults that are backed up and restored through the following processes include the IP address, Computer Name, Tower name and receiver allocation.

Save Defaults

1. Log in to the Webmin application according to "Webmin Logons" on page 2-21.
2. Click the *Configuration* tab.
3. Click the *Save/Load Defaults* link under the *Configuration* menu along the left side of the window.
4. Click *Backup*.
5. Click the *ApexPro Backup Files* link ending with the *.tar* extension.



Mon Feb 17 09:39:17 2003

Computer: Server

Processed: Mon Feb 17 09:39:17 2003

ApexPro Backup Files: (Click on the link to download the file.) Server_20030217.tar

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6. Click *Save*.
7. Navigate to where you want to save the configuration file and click *Save*.
8. Click *Close* to close the *Download Complete* window.

Load Defaults

WARNING

LOSS OF MONITORING — The ApexPro Telemetry Server software must be stopped before performing this procedure. Notify the site's biomedical department so patient communications can be established with an alternative central station before stopping the ApexPro Telemetry Server software (the Bed Duplicator application can be used to temporarily transfer patients to an alternate ApexPro tower. See "Temporary Bed Transfer" on page 4-4). Shut down of the ApexPro Telemetry

Server causes disruption of monitoring function at the CIC Pro.

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Configuration* tab.
3. Click the *Run* link.
4. Click *Stop*, next to *ApexPro Commands*, to stop the ApexPro Telemetry Server software.
5. Once the ApexPro Telemetry Server software stops, click the *Save/Load Defaults* link under the *Configuration* menu along the left side of the window.

   NOTE

   Check to make sure the *ApexPro Status* is *Stopped* before continuing this procedure.
6. Click *Restore*.
7. Click *Browse*.
8. Use the *Choose File* window to navigate to the ApexPro Telemetry Server backup file you want to restore. Select the file and click *Open*.
9. Click *Restore*. The message *Restore succeeded* displays in the *ApexPro Status* field if the restore succeeds.

For your notes

4 Maintenance

For your notes

General

Recommended Tools

- Leakage Tester
- Digital Multimeter
- ESD Mat and Wrist Strap
- Standard Hand Tools

Manufacturer Recommendations

WARNING

EQUIPMENT FAILURE/HEALTH HAZARD — The manufacturer does not in any manner, assume the responsibility for performing the recommended maintenance schedule, unless an Equipment Maintenance Agreement exists. The sole responsibility rests with the individuals, hospitals, or institutions utilizing the device. Failure on the part of all responsible individuals, hospitals or institutions, employing the use of this device, to implement the recommended maintenance schedule may cause equipment failure and possible health hazards.

To make sure the ApexPro Telemetry Server hardware remains in proper operational and functional order, a good maintenance schedule must be adhered to. The manufacturer recommends the following:

- **Visual Inspection:** Should be performed by service personnel upon receipt of the equipment, one time per year thereafter, and prior to servicing the unit.
- **Cleaning:** Should be performed by service personnel upon receipt of the equipment, one time per year thereafter, and each time the unit is serviced.
- **Calibration:** No calibration is required.
- **Electrical Safety Checks:** Should be performed by service personnel upon receipt of the equipment, one time per year thereafter, and every time the unit is serviced.
- **Checkout Procedure:** Should be performed by qualified service personnel upon receipt of the equipment, one time per year thereafter, and each time the unit is serviced.
- **Replacing the Hard Drive:** You should replace the hard drive every three years. Refer to “Hard Drive” on page 6-30 for hard drive replacement information.

PM Form

For the latest PM form regarding this product, contact GE Medical Systems *Information Technologies* Service. Make a copy of the GE Unity Network Information Suite Server PM form and use the copy to help guide you as you go through this section of the manual. The PM form can then be archived for reference after completion of all the steps required to completely test the equipment.

If, for any reason, any of the procedures or tests results are not within the indicated standards, contact GE Medical Systems *Information Technologies* Technical Support (see “How to Reach Us...”).

Schedule

WARNING

EQUIPMENT FAILURE/HEALTH HAZARD — The manufacturer does not in any manner, assume the responsibility for performing the recommended maintenance schedule, unless an Equipment Maintenance Agreement exists. The sole responsibility rests with the individuals, hospitals, or institutions utilizing the device. Failure on the part of all responsible individuals, hospitals or institutions, employing the use of this device, to implement the recommended maintenance schedule may cause equipment failure and possible health hazards.

Temporary Bed Transfer

WARNINGS

LOSS OF MONITORING — Before shutting down the ApexPro Telemetry Server, use the following procedure to duplicate beds on the ApexPro Telemetry Server to an alternate tower. If the beds are not duplicated to an alternate tower and patient communication is not re-established, disruption of monitoring function will occur at the CIC Pro when the ApexPro Telemetry Server is shut down.

LOSS OF MONITORING — If sufficient capacity is not available at either an alternate tower or a CIC Pro central station to account all the beds on the ApexPro Telemetry Server, notify the site’s biomedical department so patient communications can be established using an alternative method. Patient monitoring will be lost if this instruction is not followed.

Beds can be copied/duplicated to an alternate ApexPro tower if the ApexPro Telemetry Server needs to be shut down or replaced. This allows for continuous monitoring of the beds while the ApexPro Telemetry Server is offline.

NOTE

The following procedure requires an alternate ApexPro tower running on the network, with a sufficient number of open receivers to accommodate copies of the beds admitted to the ApexPro Telemetry Server.

See “Bed Duplicator” on page 2-30 for detailed information about the Bed Duplicator application.

1. Start the Bed Duplicator application according to "Bed Duplicator Startup" on page 2-30.

   NOTE

   If possible, run the Bed Duplicator from an ApexPro Telemetry Server that will not be taken offline because the Bed Duplicator application displays network bed admit/discharge activity in the *Log Messages* window. *Log Messages* information is purged if the Bed Duplicator application is shut down.

2. Record the names of the beds on the ApexPro Telemetry Server. Bed names are changed during duplication, and will need to be restored when the beds are copied back to the ApexPro Telemetry Server.
3. Copy the beds on the ApexPro Telemetry Server to the alternate tower according to "Bed Duplication" on page 2-32.
4. Ensure all beds copied to the alternate tower are assigned to slots and monitored at a CIC Pro.
5. Shut down the ApexPro Telemetry Server, as required, for maintenance, service, troubleshooting or replacement.
6. After the ApexPro Telemetry Server is brought back online, copy any beds (as required) from the alternate tower to the ApexPro Telemetry Server. Examples of such beds would include:
   - Beds admitted while the ApexPro Telemetry Server was offline.
   - If the ApexPro Telemetry Server was replaced, all beds copied to the alternate tower.
7. Ensure all beds on the ApexPro Telemetry Server brought back online are assigned to slots and monitored at a CIC Pro.
8. Rename beds as required.
9. Discharge duplicate beds on the alternate tower.
10. After the discharge process is complete, (when the discharge message is removed from the *Pending Transactions* field*)*, exit the Bed Duplicator application according to "Bed Duplicator Shut Down" on page 2-32.

Visual Inspection

About the Visual Inspection

Carefully inspect the ApexPro Telemetry Server and its components prior to installation, once each year thereafter, and each time the equipment is serviced.

Procedure

To perform a complete visual inspection of the equipment, follow these steps:

1. GENERAL INSPECTION — Inspect the external surfaces of the computer components and display monitor for obvious physical damage. Do NOT use the

device if physical damage is evident. Refer damaged equipment to qualified service personnel for repair.

2. FANS — Inspect all cooling fans in the computer tower to make sure they are in good working order and are not clogged with dust. These fans draw outside air into the tower to cool the components inside.
3. CONNECTORS — Inspect all external connectors for damaged pins, prongs and connector housings. Refer damaged equipment to qualified service personnel for repair. Ensure that all connections are properly seated and secure.
4. CABLE INSULATION — Inspect all cables, insulation, strain-reliefs and connectors for damage, cracks or degradation. Refer damaged equipment to qualified service personnel for repair.

Cleaning

Before Cleaning

WARNING

SHOCK HAZARD — In order to remove power from the ApexPro Telemetry Server, disconnect the power cord from the wall outlet. The on/off button on the front panel does not disconnect the ApexPro Telemetry Server from AC power.

Additionally, wait after disconnecting the ApexPro Telemetry Server power cord from the wall outlet. The ApexPro Telemetry Server remains energized for a period of time after shutdown.

Failure to follow these instructions could result in electrical shock.

1. Shutdown the ApexPro Telemetry Server according to "Stop/Start/Restart ApexPro Telemetry Server" on page 2-29.
2. Turn off and unplug the ApexPro Telemetry Server.

   NOTE

   When unplugging, pull on the plug, not the cord.

External Surfaces

CAUTION

EQUIPMENT DAMAGE/SHOCK HAZARD —Make sure water does not run into any of the openings of the ApexPro Telemetry Server. An electrical shock hazard exists and/or damage may result if water is allowed to get inside the ApexPro Telemetry Server. Failure to follow these instructions could result in equipment damage and/or electrical shock.

Use a soft, lint-free cloth dampened with clean water to wipe down the external surfaces of the ApexPro Telemetry Server. Do NOT use aerosol liquid sprays, solvents, or abrasives.

Internal Components

1. Verify the ApexPro Telemetry Server is turned off and unplugged.
2. Disconnect all cords/cables from the ApexPro Telemetry Server.
3. Remove the access panels on the ApexPro Telemetry Server. Using a compressed air duster recommended for computers and electronics, carefully blow out any accumulated dust.

For component level disassembly/reassembly information, refer to “Disassembly/ Assembly” on page 6-4.

Fans

Remove all of the dust from the fans and the fan intakes. The fans and fan intakes usually accumulate the most dust. Accumulated dust can clog the fans and fan intakes and prevent proper cooling.

The ApexPro Telemetry Server is equipped with two fan filters at the front of the chassis. These filters reduce the amount of dust and cooling air in the interior of the unit.

Fan and drive filters should be replaced regularly. See “Fan Filter” on page 6-7 and “Drive Filter” on page 6-9.

Controlling Electrostatic Discharge Damage

All external connector inputs and outputs of the device are designed with protection from Electrostatic Discharge Damage (ESD) damage. However, if the interior of the device needs to be accessed for any reason, internal components and assemblies are susceptible to ESD damage. This includes human hands, non-ESD protected work stations and/or improperly grounded test equipment.

The following guidelines help make a service workstation more resistant to the ESD damage:

- Discharge any static charge you may have built up before handling semiconductors or assemblies containing semiconductors. This can be done by touching any bare metal on the ApexPro Telemetry Server chassis, or cable connector jacks on the back of the unit. Do this frequently and repeatedly while working on the unit.
- Wear a grounded, antistatic wristband (3M part number 2046 or equivalent) or heel strap at all times while handling or repairing assemblies containing semiconductors.
- Use properly grounded test equipment.
- Use a static-free work surface (3M part number 8210 or equivalent) while handling or working on assemblies containing semiconductors.
- Do NOT remove semiconductors or assemblies containing semiconductors from antistatic containers (Velo-stat bags) until absolutely necessary.
- Make sure power to an assembly is turned off before removing or inserting any component boards.
- Do NOT slide semiconductors or electrical/electronic assemblies across any surface.
- Do NOT touch semiconductor leads unless absolutely necessary.
- Semiconductors and electrical/electronic assemblies should be stored only in antistatic bags or boxes.

These guidelines cannot guaranty a 100% static-free workstation, but greatly reduce the potential for failure of any electrical/electronic assemblies due to electrostatic discharge.

Electrical Safety Tests

General

Electrical safety tests provide a method of determining if potential electrical health hazards to the operator of the device exist.

These tests apply to the server, all peripherals, and their three-prong plugs.

Recommendations

WARNING
EQUIPMENT FAILURE/HEALTH HAZARD — Unless you have an Equipment Maintenance Contract, GE Medical Systems *Information Technologies* does not in any manner assume the responsibility for performing the recommended maintenance procedures. The sole responsibility rests with the individual or institution using the equipment. *Information Technologies* service personnel may, at their discretion, follow the procedures provided in this manual as a guide during visits to the equipment site. Failure to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.

To help you establish a systematic maintenance routine, GE Medical Systems *Information Technologies* recommends that you perform all safety tests presented in this chapter:

- Upon receipt of the device,
- Every twelve months thereafter,
- Each time the main enclosure is disassembled or a circuit board is removed, tested, repaired, or replaced, and
- Record the date and results on the “Repair Log” on page 4-20.

Test Conditions

Electrical safety tests may be performed under normal ambient conditions of temperature, humidity, and pressure.

Test Equipment

The manufacturer recommended test equipment required to perform electrical safety tests is listed below. Equivalent equipment may be substituted as necessary.

Item	Specifications
Leakage Current Tester	See figures below
Digital Multimeter (DMM)	resistance, AC voltage

Wall Receptacle Test

Before starting the tests, the wall receptacle from which the device will get electrical power must be checked. This test checks the condition of the wall receptacle to ensure correct results from leakage tests.

For international wall receptacles, refer to the internal standards agencies of that particular country. Use a digital multimeter to ensure the wall receptacle is wired properly.

If other than normal polarity and ground is indicated, corrective action must be taken before proceeding. The results of the following tests will be meaningless unless a properly wired wall receptacle is used.

Ground (Earth) Integrity

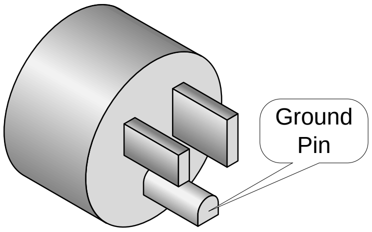
Listed below are two methods for checking the ground (earth) integrity, “Ground Continuity Test” on page 4-12 and “Electrical Leakage Tests” on page 4-12. These tests determine whether the device’s exposed metal and power inlet’s earth (ground) connection has a power ground fault condition.

Perform the test method below that is required by your country/local governing safety organization.

Ground Continuity Test

Completion of this test is checked by the following steps:

1. Disconnect the DUT (device under test) from the wall receptacle.
2. Connect the negative (–) lead of the ohm meter to the protective earth terminal (ground pin in power inlet connector) or the protective earth pin in the MAINS PLUG (ground pin in power cord). Refer to the US 120VAC power cord figure below.



3. Set the DMM to measure Ohms.
4. Connect the positive (+) lead of the Ohm meter to all exposed metal surfaces on the DUT. If the metal surfaces are anodized or painted scrape off a small area in a inconspicuous area for the probe to make contact with the metal.
5. Resistance should read to pass:
   - 0.1 ohm or less to power inlet ground pin
   - 0.2 ohms or less to power cord ground pin

Electrical Leakage Tests

Impedance of Protective Earth Connection

This test, unlike a ground continuity test, will also stress the ground system by using special ground bond testers e.g. Kikusui (model 872 or TOS 6100) or Associated Research model HYAMP® Jr. Model 3030D.

This test normally is only required as a manufacturing production test to receive safety agency compliance UL 609050, CSA 609050-00 (C22.2) and EN60950.

Some country agency’s DO require this test after field equipment repairs i.e. Germany’s DIN VDE 0751 standards.

Consult your country/local safety agency if in question.

Compliance is checked by the following steps:

1. A current not less than 10A and not exceeding 25A from a current source with a frequency of 50 or 60 Hz with a no-load voltage not exceeding 6V is passed for at least 5 seconds through the PROTECTIVE EARTH TERMINAL or the protective earth pin in the MAINS PLUG and each ACCESSIBLE METAL PART which could become LIVE in case of failure in BASIC INSULATION.
2. The voltage drop between the parts described is measured and the impedance determined from the current and voltage drop. It shall not exceed the values indicated.

For EQUIPMENT without a POWER SUPPLY CORD the impedance between the PROTECTIVE EARTH TERMINAL and any ACCESSIBLE METAL PART which is PROTECTIVELY EARTHED shall not exceed 0.1 ohms

For EQUIPMENT with a POWER SUPPLY CORD the impedance between the protective earth pin in the MAINS PLUG and any ACCESSIBLE METAL PART which is PROTECTIVELY EARTHED shall not exceed 0.2 ohms.

When taking this measurement, move the customer’s power cord around, no fluctuations in resistance should be observed.

Ground (Earth) Wire Leakage Current Tests

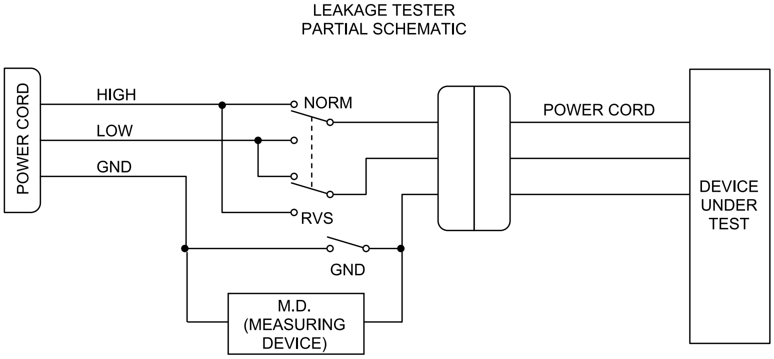
Perform this test to measure current leakage through the ground (earth) wire of the equipment during normal operation.

1. Set the leakage tester switches as follows:
   - Set the GND switch to **GND OPEN**.
   - Set the polarity switch to **NORM/FORWARD**.
   - Set the power switch to **OFF**.
2. Connect a digital multimeter (DMM) to the METER jacks on the leakage tester. Set the DMM to measure AC millivolts.
3. Connect the power cord of the device under test to the power receptacle on the rear of the leakage tester.

   NOTE:

   The device under test is to be tested at its normal operating voltage.
4. Set the leakage tester power switch to ON.
5. Set the power switch of the device under test to ON.
6. Read the current leakage indicated on DMM. If the reading is greater than 3.5mA, the device under test fails and should be repaired and tested again.
7. Set the polarity switch on the leakage tester to RVS (reverse).
8. Read the current leakage indicated on DMM. If the reading is greater than 3.5mA, the device under test fails and should be repaired and tested again.

9. Set the leakage tester power switch to OFF.



NOTE

The MD (measuring device) is the circuitry defined by the appropriate standard for measuring leakage current.

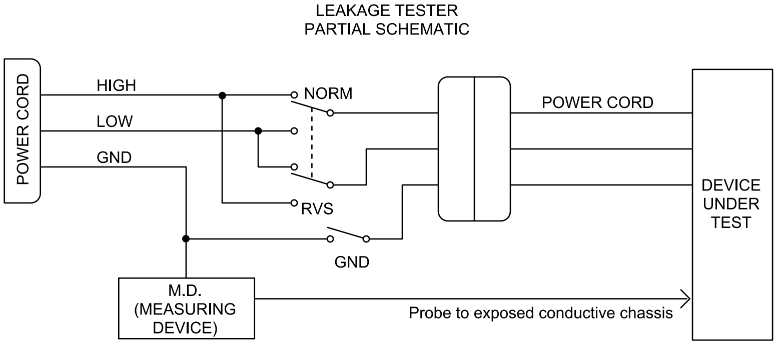
The measuring devices, defined by various standard organizations (IEC, UL, etc.), produce almost identical test measurement results.

Enclosure (Chassis) Leakage Current Test

Perform this test to measure current leakage through exposed conductive surfaces on the device under test during normal operation.

1. Set the leakage tester switches as follows:
   - GND switch - OPEN,
   - Polarity switch - NORM.
2. Connect a meter lead between the CHAS connector on the rear of the leakage tester and an unpainted, non-anodized chassis ground on the unit under test.
3. Set the leakage tester power switch to ON.
4. Read the current leakage indicated on DMM. If the reading is greater than 3.5 mA the device under test fails and should be repaired and tested again.
5. Set the polarity switch to RVS and observe the same meter readings as in the previous step.
6. Set the GND switch on the leakage tester to CLOSED.
7. Read the current leakage indicated on DMM. If the reading is greater than 3.5 mA the device under test fails and should be repaired and tested again.
8. Set the polarity switch to RVS and observe the same meter readings as in the previous step.
9. Set the polarity switch to NORMAL and observe the same meter readings as in the previous step.

10. Set the leakage tester power switch to OFF and remove the meter lead connected in step 2.


LEAKAGE TESTER
PARTIAL SCHEMATIC
POWER CORD
HIGH
LOW
GND
NORM
RVS
GND
POWER CORD
DEVICE
UNDER
TEST
M.D.
(MEASURING
DEVICE)
Probe to exposed conductive chassis

Test Completion

Disconnect all test equipment from the device. Disconnect the device power cord plug from the leakage tester power receptacle. Disconnect the leakage tester from the wall receptacle.

Checkout

The checkout procedure process provides a method of verifying operational and functional performance without having to disassemble the unit. Failure to attain the prescribed results indicates a need for calibration, configuration, or repair of the equipment.

Perform the checkout procedures upon receipt of the equipment, every year thereafter, and each time a component is removed or replaced.

The checkout procedure process is based on the assumption that the equipment being tested is using known, good cables. It also requires that the user be familiar with the operation of the system. For more information concerning the operation of these components, refer to the operator manual associated with the equipment.

Perform all of the checkout procedures included in this section to completely test the system for proper function and operation.

General

Follow these instructions to completely test the system for proper function and operation.

NOTE

You must close all files for this process to run. If the disk drive is currently in use, a message asks if you want to reschedule the disk checking for the next time you restart your system. Then, the next time you restart your system, disk checking runs. Your disk drive will not be available to run other tasks while this process runs.

NOTE

Close all files before starting the checkout procedures.

Checkout Procedures

Disk Check

WARNING

LOSS OF MONITORING — This procedure will disrupt monitoring function at the CIC Pro. Before performing this procedure, notify the site’s biomedical department so patient communications can be established with an alternative central station (the Bed Duplicator application can be used to temporarily transfer beds to an alternate ApexPro tower. See “Temporary Bed Transfer” on page 4-4). Shut down of the ApexPro Telemetry Server causes disruption of monitoring function at the CIC Pro.

NOTE

This procedure requires a VNC connection. See “VNC Logon” on page 2-20.

To run disk check:

1. Select *Start* > *Shut Down* > *Log off*, then click *OK*.
2. Log back in as administrator, according to “ApexPro Telemetry Server Service Logons” on page 2-18.
3. After the ApexPro Telemetry Server desktop is displayed, double-click *My Computer*
4. Right-click the disk drive you want to check and select *Properties*.
5. Select the *Tools* tab.
6. Under *Error-checking*, click *Check Now*.
7. Check both selections and click *Start*.
8. Click *Yes* in the *Checking Local Disk* window.
9. Select *Start* > *Shut Down* >*Restart,* then click *OK*. The disk check is performed as the ApexPro Telemetry Server reboots.
10. Repeat this procedure for the other drive.

Receiver Function/Available Receivers Check

Determine the Unity network devices that are communicating over the network by using the Webmin Unity network function. See “Unity Network Device Detection” on page 5-18.

NOTE

This procedure requires a VNC connection. See “VNC Logon” on page 2-20.

NOTE

Type **help** at any time to see a list of commands.3

1. Select *Start* > *Run*
2. Type **cmd**, then press **Enter**.
3. A command window opens displaying the prompt:

   C:\Documents and settings\cic>
4. Type **cd <space> ..\..\program files\marquette\pts\3.X** (X= software version) and press **Enter**.
5. Verify the prompt:

   C:\Program Files\marquette\PTS\X.X> (X= software version)
6. In the command window at the *PTS\X.X* prompt, type **ptsconfig** and press **Enter**.
7. Type **display receiver** and press **Enter**.
8. Note the number of unassigned receivers and subtract this number from the number of admitted beds noted above.

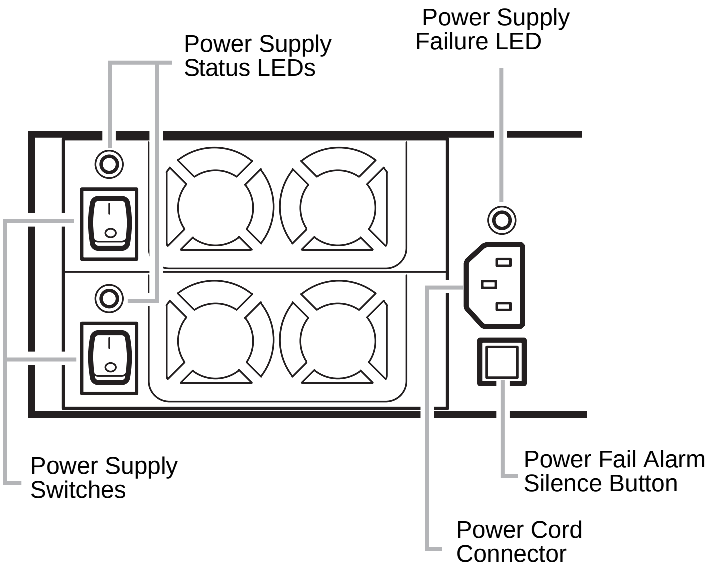
9. The number of beds correlates to the number of receivers indicated by the number of green Receiver Slots LEDs on the back of the receiver system. Four receivers per one green Receiver Slots LED.

1 LED =	4 receivers
2 LEDs =	8 receivers
3 LEDs =	12 receivers
4 LEDs =	16 receivers

Power Fail Alarm Verification Test (Power)

1. Switch a power supply switch off. An alarm should sound.

BACK PANEL


Power Supply Status LEDs
Power Supply Failure LED
Power Supply Switches
Power Fail Alarm Silence Button
Power Cord Connector

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2. Press the power fail alarm silence button under the power cord connector.
3. Repeat this procedure for the remaining power supply.

Maintenance Checklist

Use the following checklist to ensure maintenance completion.

☐ "Visual Inspection" on page 4-5

1. ___ General
2. ___ Fans
3. ___ Connectors
4. ___ Cable Insulation

☐ "Cleaning" on page 4-7

1. ___ External Surfaces
2. ___ Internal Components
3. ___ Fans
4.

☐ "Electrical Safety Tests" on page 4-10

1. ___ Wall Receptacle Test
2. ___ Ground Continuity Test
3. ___ Ground (Earth) Wire Leakage Current Tests
4. ___ Enclosure (Chassis) Leakage Current Tests

☐ "Checkout Procedures" on page 4-16

1. ___ Disk Check
2. ___ Receiver Function/Available Receivers Check
3. ___ Power Fail Alarm Verification Test (Power)

Repair Log

A repair log is included for your convenience to record the repair history of this product.

Unit Serial Number:
Institution Name:

Date	**Maintenance/Repair**	**Technician**

5 Troubleshooting

For your notes

General Fault Isolation

Visual Inspection

A thorough visual inspection of the equipment can save time. Small things—disconnected cables, foreign debris on circuit boards, missing hardware, loose components—can frequently cause symptoms and equipment failures that may appear to be unrelated and difficult to track.

The following tests are highly recommended to remove these “simple” failures as causes of problems.

- Set the ON/OFF switch to the OFF position and disconnect the Receiver System from its power source.
- Refer to “Disassembly/Assembly” on page 6-4 and perform an internal visual inspection of the components.

Take the time to make all the recommended visual checks (refer to the visual inspection table below) before starting any detailed troubleshooting procedures.

Area	Look for the following problems:
I/O Connectors and Interface Cables	■ Fraying or other damage. ■ Bent prongs or pins. ■ Cracked housing. ■ Loose screws in plugs. ■ Excessive cable tension or wear. ■ Secure mounting hardware.
Internal Harnesses and Cables	■ Excessive tension or wear. ■ Loose connection. ■ Strain reliefs out of place.
Circuit Boards	■ Moisture, dust, or debris (top and bottom). ■ Loose or missing components. ■ Burn damage or smell of over-heated components. ■ Socketed components not firmly seated. ■ PCB not seated properly in edge connectors. ■ Solder problems: cracks, splashes on board, incomplete feedthrough, prior modifications or repairs.
Ground Wires/Wiring	■ Loose wires or ground strap connections. ■ Faulty wiring. ■ Wires pinched or in vulnerable position.
Mounting Hardware	■ Loose or missing screws or other hardware, especially fasteners used as connections to ground planes on PCBs. ■ Receiver System mounted loosely or near vibration.
Power Source	■ Faulty wiring, especially AC outlet. ■ Circuit not dedicated to system. Symptoms of power source problems include static discharge, resetting problems, and noise.

Boot Failure

- Verify that all components are connected correctly and the unit is plugged into a known good outlet.
- Ensure that all cables are properly seated.
- Shutdown, turn off and unplug the ApexPro Telemetry Server.
- Follow all antistatic precautions according to "Controlling Electrostatic Discharge Damage" on page 4-9, remove all access panels and ensure all internal components are properly seated.

Task	Check	Correct
Check for connection problems	■ Verify that all components are connected correctly and the unit is plugged into a known good outlet. ■ Ensure that all cables are properly seated. ■ Has the power switch on the front of the ApexPro Telemetry Server been firmly pressed? ■ Are the power supply switches switches on?	■ Correctly/firmly ensure all components/cables properly connected/seated. ■ Press power switches firmly.
Check for power supply problems	■ Are power supply fans spinning? ■ Ensure power supply LEDs are lit. ■ Is UPS starting and working correctly? ■ Ensure both power supplies firmly seated and secured in the ApexPro Telemetry Server.	■ Firmly seat/secure power supplies. ■ Power supplies/UPS may be malfunctioning.
Check for short circuit	LEDs are blinking erratically, turning amber, or staying off.	Short circuit may exist.

ApexPro Telemetry Server Connection Failure

NOTE

Keyboard/Video/Mouse (KVM) may be required in certain cases to access the ApexPro Telemetry Server desktop.

Network Connection

- Connect to ApexPro Telemetry Server through the network using Webmin. See "Webmin Logons" on page 2-21.
- Connect to ApexPro Telemetry Server through the network using VNC. See "VNC Logon" on page 2-20.

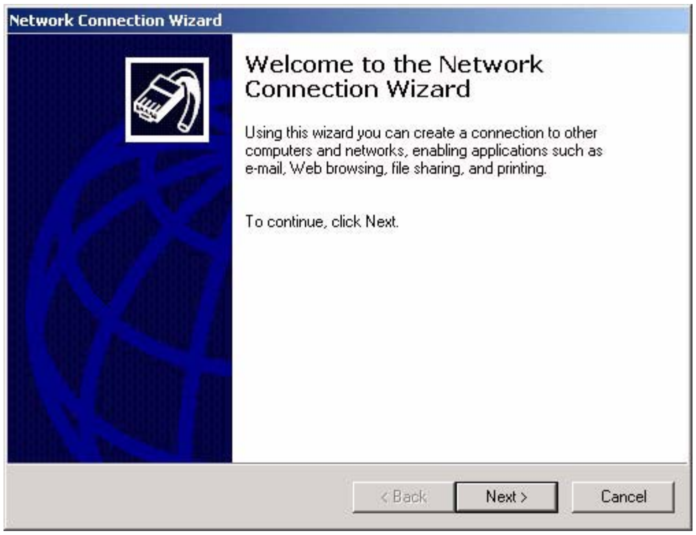
Serial Connection

NOTE

If unable to access the ATS through a network connection for any reason, a serial connection may be used.

To connect to the ATS using VNC through a serial connection, connect a null modem cable to the ATS COM1 port and establish a serial guest connection to the ATS as follows:

1. On the remote computer, select *Start* > *Settings* > *Network and Dial-up Connections* > *Make New Connection.*
2. Click *Next* in the *Network Connection Wizard* window.



Network Connection Wizard

Welcome to the Network Connection Wizard

Using this wizard you can create a connection to other computers and networks, enabling applications such as e-mail, Web browsing, file sharing, and printing.

To continue, click Next.

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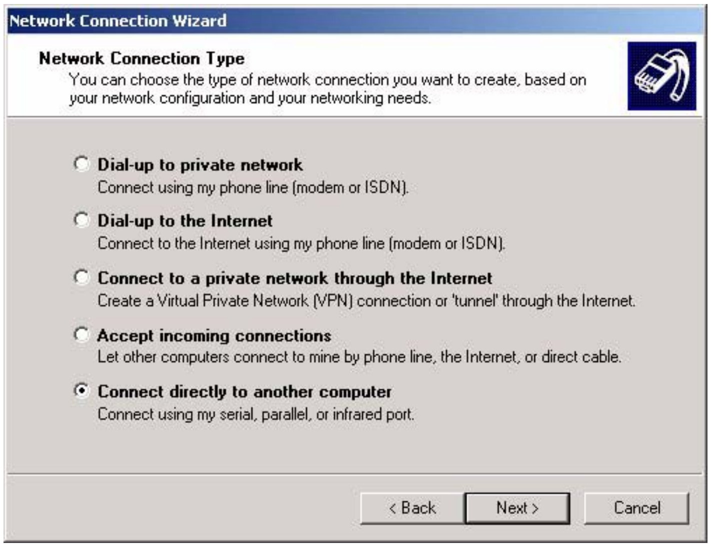
3. In the *Network Connection Type* window, select the *Connect directly to another computer* radio button and click *Next*.



Network Connection Wizard

Network Connection Type

You can choose the type of network connection you want to create, based on your network configuration and your networking needs.

○ **Dial-up to private network**
Connect using my phone line (modem or ISDN).

○ **Dial-up to the Internet**
Connect to the Internet using my phone line (modem or ISDN).

○ **Connect to a private network through the Internet**
Create a Virtual Private Network (VPN) connection or 'tunnel' through the Internet.

○ **Accept incoming connections**
Let other computers connect to mine by phone line, the Internet, or direct cable.

● **Connect directly to another computer**
Connect using my serial, parallel, or infrared port.

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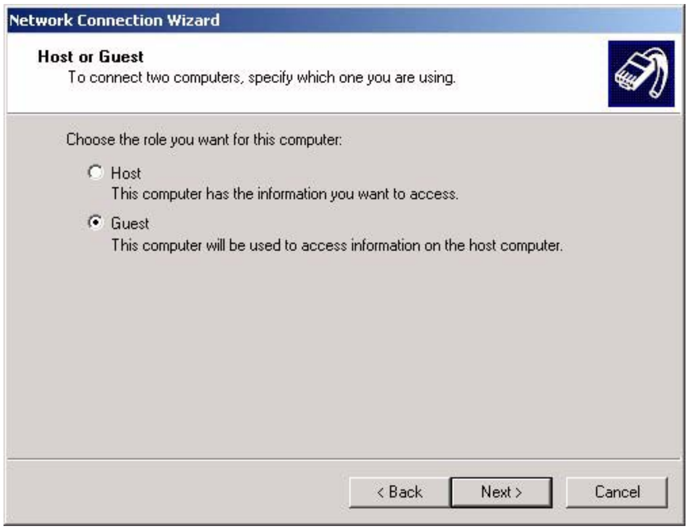
4. In the *Host or Guest* window, select the *Guest* radio button and click *Next*.



Network Connection Wizard

Host or Guest

To connect two computers, specify which one you are using.

Choose the role you want for this computer:

○ Host
This computer has the information you want to access.

● Guest
This computer will be used to access information on the host computer.

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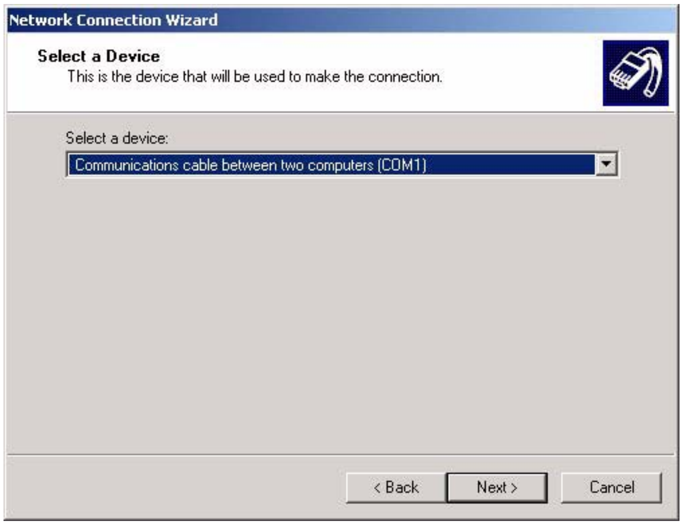
5. In the *Select a Device* window, select *Communications cable between two computers (COM1)* from the pull-down list and click *Next*.



Network Connection Wizard

Select a Device

This is the device that will be used to make the connection.

Select a device:
Communications cable between two computers (COM1)

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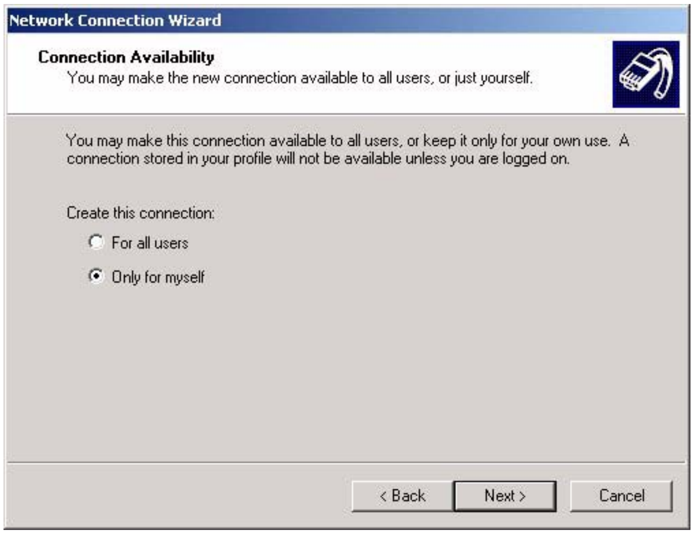
6. In the *Connection Availability* window, select the *Only for myself* radio button and click *Next*.



Network Connection Wizard

Connection Availability

You may make the new connection available to all users, or just yourself.

You may make this connection available to all users, or keep it only for your own use. A connection stored in your profile will not be available unless you are logged on.

Create this connection:

○ For all users

● Only for myself

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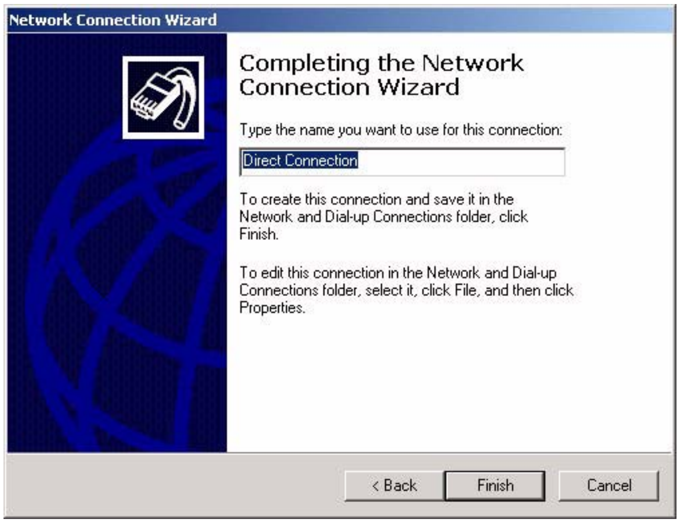
7. Type a name for the connection and click *Finish*.



Network Connection Wizard

Completing the Network Connection Wizard

Type the name you want to use for this connection:

Direct Connection

To create this connection and save it in the Network and Dial-up Connections folder, click Finish.

To edit this connection in the Network and Dial-up Connections folder, select it, click File, and then click Properties.

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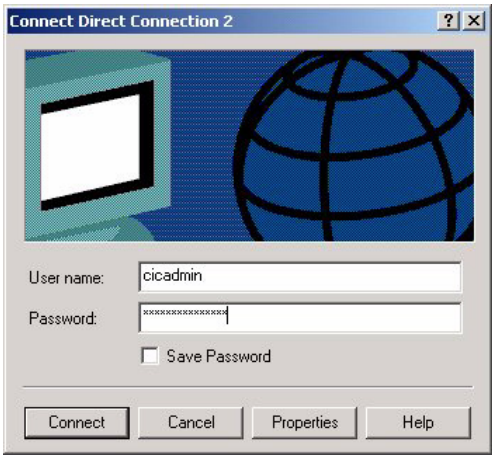
8. Type the User Name and Password for the connection.

NOTE

Only the cicadm or administrator logons are enabled on the ApexPro Telemetry Server for direct connection. See “ApexPro Telemetry Server Service Logons” on page 2-18.



Connect Direct Connection 2

User name: cicadmin

Password: ***************

☐ Save Password

?
Connect
Cancel
Properties
Help

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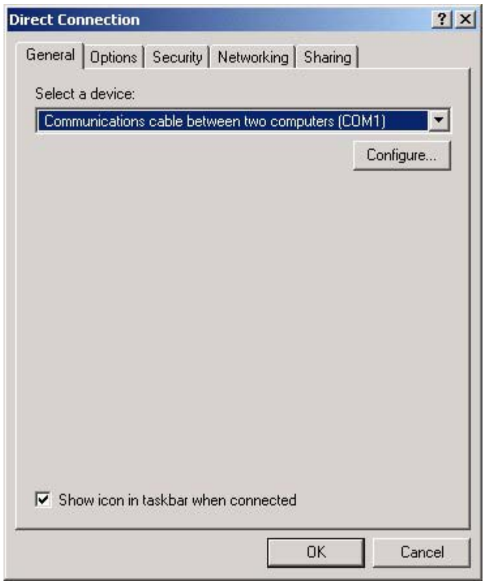
9. Click *Properties*.
10. In the *Direct Connection* window, click *Configure.*



Direct Connection

Select a device: Communications cable between two computers (COM1)

☑ Show icon in taskbar when connected

?
General
Options
Security
Networking
Sharing
Configure...
OK
Cancel

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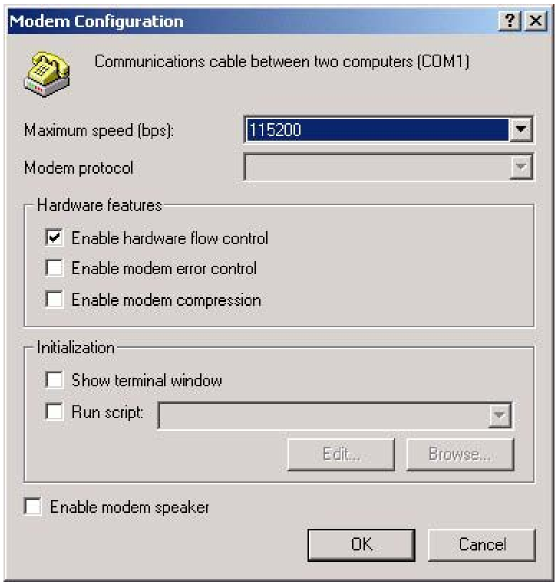
11. In the *Modem Configuration* window, select *115200* from the *maximum speed (bps)* pull-down list and click *OK*.



Modem Configuration

Communications cable between two computers (COM1)

Maximum speed (bps): 115200

Modem protocol

Hardware features

☑ Enable hardware flow control

☐ Enable modem error control

☐ Enable modem compression

Initialization

☐ Show terminal window

☐ Run script:

☐ Enable modem speaker

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12. Click *OK* in the *Modem Configuration* window.
13. Click *OK* in the *Direct Connection* window.
14. Plug a null modem cable from the COM1 port of the remote computer to the serial port of the ApexPro Telemetry Server.
15. Click *Connect*.
16. Once a connection is established, start the Internet Explorer application on the remote computer.
17. Type **http://192.168.1.3:5800** into the *Address* field and press **Enter**.
18. Logon to the ApexPro Telemetry Server desktop using the password corresponding to the user name defined in step 8.

Component Troubleshooting

Symptom	Possible Reason	Solution/Course of Action	FRU Procedure
Inability to activate a single power supply.	Mechanical wear of power supply switch.	Replace power supply.	See “Power Module” on page 6-50.
	Power supply failure.	Replace power supply.	See “Power Module” on page 6-50.
Loss of system power (i.e. both power supplies).	Dual power supply failure.	Replace both power supplies.	See “Power Module” on page 6-50.
	Loss of external supply / disconnected power cord.	Verify external power supply and power cord.	N/A
	Overheating due to dust or debris.	Clean system.	See “Fan Filter” on page 6-7.
			See “Drive Filter” on page 6-9.
Repeated system reboot	Disconnected network cable or down network.	Verify RX, MC, and IX network ports are connected to networks.	N/A
Sudden operating system shutdown (i.e. normal shutdown).	Electrical failure of CPU.	Replace CPU assembly.	See “CPU Boards” on page 6-39.
	Electrical failure of RAID card.	Replace RAID card.	See “RAID Card” on page 6-12.
	Overheating due to CPU fan failure.	Replace CPU fan and monitor CPU for damage.	See “CPU Fan” on page 6-36.
	Overheating due to low case airflow.	Clean system or replace system fans.	See “Fan Filter” on page 6-7.
			See “Chassis Fan” on page 6-38.
Power Supply Failure Alarm (i.e. Loss of single Power Supply).	Single power supply failure.	Replace power supply.	See “Power Module” on page 6-50.
	Overheating due to dust or debris.	Clean system.	See “Fan Filter” on page 6-7.
			See “Drive Filter” on page 6-9.
Unable to communicate via serial port/KVM.	Serial cable failure.	Replace cable.	N/A
	CPU board failure.	Replace CPU board.	See “CPU Boards” on page 6-39.
POST memory error	RAM failure.	Replace memory DIMMs.	See “CPU Boards” on page 6-39.
Loss, delayed, or corrupt patient data.	RAM failure.	Replace memory DIMMs.	See “CPU Boards” on page 6-39.
Loss of functionality on all PCI cards: SNMP, IX NIC.	Motherboard or backplane damage.	Replace motherboard and/ or backplane riser.	See “CPU Boards” on page 6-39.
	PCI connector damage.	Replace motherboard and/ or backplane riser.	See “CPU Boards” on page 6-39.

Symptom	Possible Reason	Solution/Course of Action	FRU Procedure
BIOS settings not saved upon reboot/reset.	Dead BIOS battery.	Replace BIOS battery.	N/A
	Incorrect BIOS battery installation (reversed polarity).	Correctly re-install or replace BIOS battery.	N/A
Loss of USB port.	USB cable failure.	Replace cable.	N/A
	USB port failure.	Replace CPU board.	See “CPU Boards” on page 6-39.
Lost or corrupted waveforms.	Loose or unconnected Ethernet cables.	Reconnect all cables.	N/A
	Ethernet cable failure.	Replace cable.	N/A
	Unity Network MC Network Ethernet card failure.	Replace CPU board and/or Unity Network MC Network Ethernet port daughterboard.	See “CPU Boards” on page 6-39.
	Misconfigured IP address.	Reconfigure IP address.	N/A
Loss of remote service connectivity (i.e. loss of Questra).	Loose or disconnected Ethernet cables.	Reconnect all cables.	N/A
	Ethernet cable failure.	Replace cable.	N/A
	Unity Network IX network Ethernet NIC failure.	Replace Unity Network IX Network NIC.	See “Network Card” on page 6-16.
	Misconfigured IP address.	Reconfigure IP address.	N/A
Inability to print	Loose or disconnected Ethernet cables.	Reconnect all cables.	N/A
	Ethernet cable failure.	Replace cable.	N/A
	Unity Network IX Network Ethernet NIC failure	Replace Unity Network IX Network NIC.	See “Network Card” on page 6-16.
	Misconfigured IP address.	Reconfigure IP address.	N/A
Loss of TeleStat.	Loose or disconnected Ethernet cables.	Reconnect all cables.	N/A
	Ethernet cable failure.	Replace cable.	N/A
	Unity Network IX Network Ethernet NIC failure.	Replace Unity Network IX Network NIC.	See “Network Card” on page 6-16.
	Misconfigured IP address.	Reconfigure IP address.	N/A
Hard disk Raid array corruption or failure.	Raid card failure.	Replace raid card.	See “RAID Card” on page 6-12.
POST error after scanning IDE drives... Message: "Problem was detected with array, Critical Status".	Single hard drive failure.	Replace hard drive.	See “Hard Drive” on page 6-30.
	Loose or disconnected hard drive connector.	Reconnect hard drive cables.	N/A
	Dust or debris in hard drive.	Clean or replace drive and/or drive filter.	See “Hard Drive” on page 6-30. See “Drive Filter” on page 6-9.
Windows System Error "Unknown Hard Drive Error".	Loss of both hard drives.	Replace both hard drives.	See “Hard Drive” on page 6-30.

Symptom	Possible Reason	Solution/Course of Action	FRU Procedure
POST error after scanning IDE drives... Message: "No drives attached to FastTrack controller..." then fails to "Disk boot failure".	Loss of both hard drives.	Replace both hard drives.	See “Hard Drive” on page 6-30.
Inability to access SNMP while server is shut down.	Discharged SNMP card battery.	AC power outage will discharge SNMP battery. Plug ApexPro Telemetry Server into a working outlet and recharge battery	N/A
	Dead SNMP card battery.	Replace SNMP card battery.	See “SNMP Battery” on page 6-24.
	incorrect SNMP card battery installation (reversed polarity).	Re-install SNMP card battery.	See “SNMP Battery” on page 6-24.
Inability to access SNMP while server is either shut down or running.	SNMP card failure.	Replace SNMP card.	See “SNMP Boards” on page 6-18.
	Incorrectly connected SNMP cable.	Verify and/or re-install cable.	N/A
	Misconfigured IP address.	Reconfigure IP address.	N/A
Inability to read temperature via SNMP.	Temperature sensor failure.	Replace temperature sensor.	See “Temperature Sensor” on page 6-52.
System overheating.	Dust or debris in fans or filters.	Clean system.	See “Fan Filter” on page 6-7.
			See “Drive Filter” on page 6-9.
	System fan failure.	Replace fans.	See “Chassis Fan” on page 6-38.
Inability to use CDROM drive.	Failure of CDROM drive.	Replace CD drive.	See “CD ROM Drive” on page 6-34.
	Loose or disconnected CDROM drive cable.	Reconnect drive cable.	N/A

Service Status Indicators

CAUTION
EQUIPMENT FAILURE — Do not ignore indicated system failures. The ApexPro Telemetry Server system can fail if conditions causing system alarms are not rectified quickly.

The ApexPro Telemetry Server is equipped with system status indicators that activate whenever specific system-critical conditions are met. Status indicator system failure alarms call attention to critical system conditions which require immediate attention.

ApexPro Telemetry Server status indicators include:

- LED indicators
- Audible alarms

LED indicators, audible alarms and software alert messages often occur together, with the LED indicators identifying the specific area or component requiring service attention. Refer to the following table:

Red LED	Critical Condition Indicated	Required Service
POWER	Redundant power supply failure.	Failing power supply must be replaced. See “Power Module” on page 6-50.
TEMP	Overheating	Poor cooling air circulation inside the ApexPro Telemetry Server/accumulated dust preventing proper cooling. Examine cooling air clearances around ApexPro Telemetry Server/clean unit according to “Cleaning” on page 4-7. NOTE: May occur in conjunction with cooling fan failure.
FAN	Cooling fan failure.	Failing cooling fan must be replaced. See “CPU Fan” on page 6-36.

Audible Alarms

WARNING

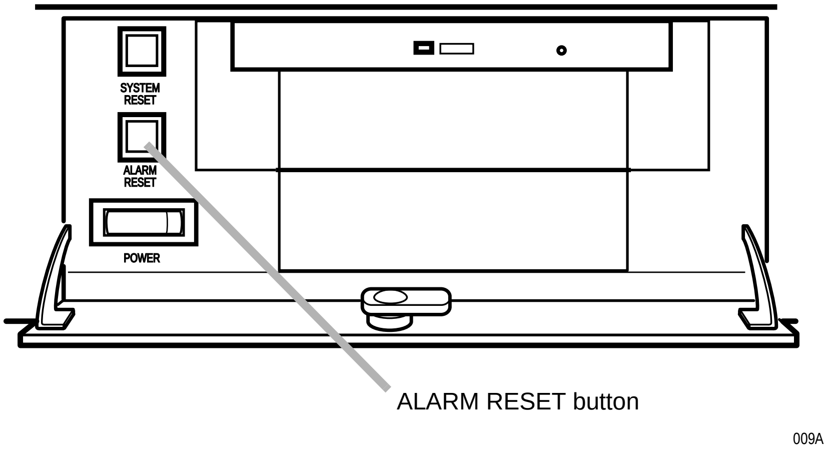
EQUPMENT FAILURE — Recurring audible alarms are a symptom of a serious system malfunction. Do not just reset the alarm when it occurs - also correct the problem causing the alarm. Equipment failure could result if the problem is not resolved.

NOTE

Audible alarms occur together with red LED status light activation. The red LEDs indicate which system-critical event is causing the alarm.

An audible alarm buzzer indicates critical system conditions requiring immediate service attention.

Audible alarms are silenced by pressing the **ALARM RESET** button, located behind a locking panel on right side of the ApexPro Telemetry Server front panel.



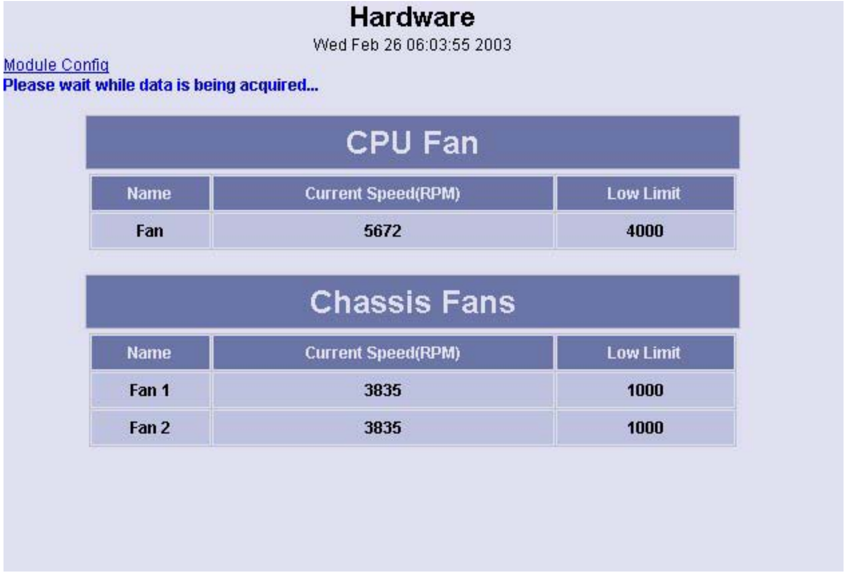
Refer to “Service Status Indicators” on page 5-13 for specific information associated with rectifying conditions indicated by an audible alarm.

Webmin Hardware Monitoring Utilities

Fans

1. Access and log into the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Diagnostics* tab.
3. Click the *Hardware* link.
4. Click the *Fans* link.

The Fans Diagnostics page displays current fan speed. Current fan speed must be faster than the *Low Limit* treshold.



Hardware

Wed Feb 26 06:03:55 2003

Please wait while data is being acquired...

CPU Fan

Name	Current Speed(RPM)	Low Limit
Fan	5672	4000

Chassis Fans

Name	Current Speed(RPM)	Low Limit
Fan 1	3835	1000
Fan 2	3835	1000

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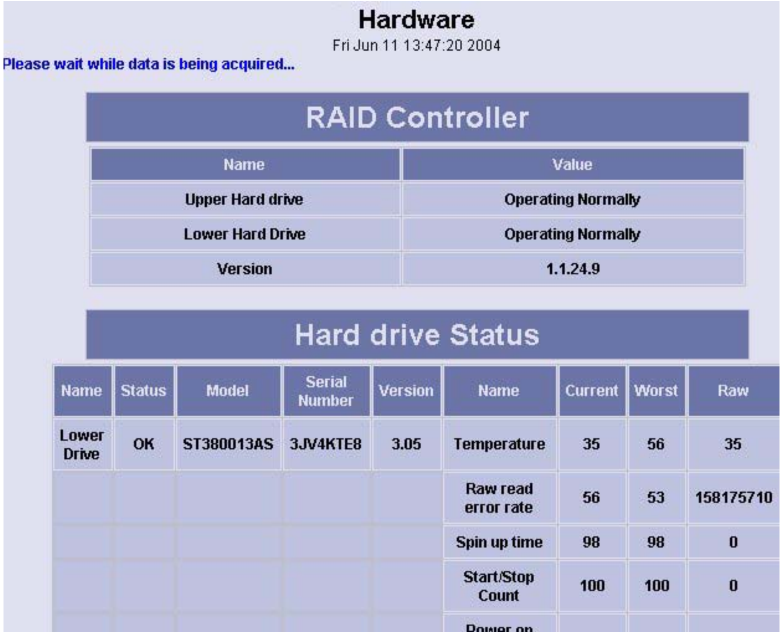
Hard Drive

1. Access and log into the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Diagnostics* tab.
3. Click the *Hardware* link.
4. Click the *Harddrive* link.



Hardware

Fri Jun 11 13:47:20 2004

Please wait while data is being acquired...

RAID Controller

Name	Value
Upper Hard drive	Operating Normally
Lower Hard Drive	Operating Normally
Version	1.1.24.9

Hard drive Status

Name	Status	Model	Serial Number	Version	Name	Current	Worst	Raw
Lower Drive	OK	ST380013AS	3JV4KTE8	3.05	Temperature	35	56	35
					Raw read error rate	56	53	158175710
					Spin up time	98	98	0
					Start/Stop Count	100	100	0
					Power on			

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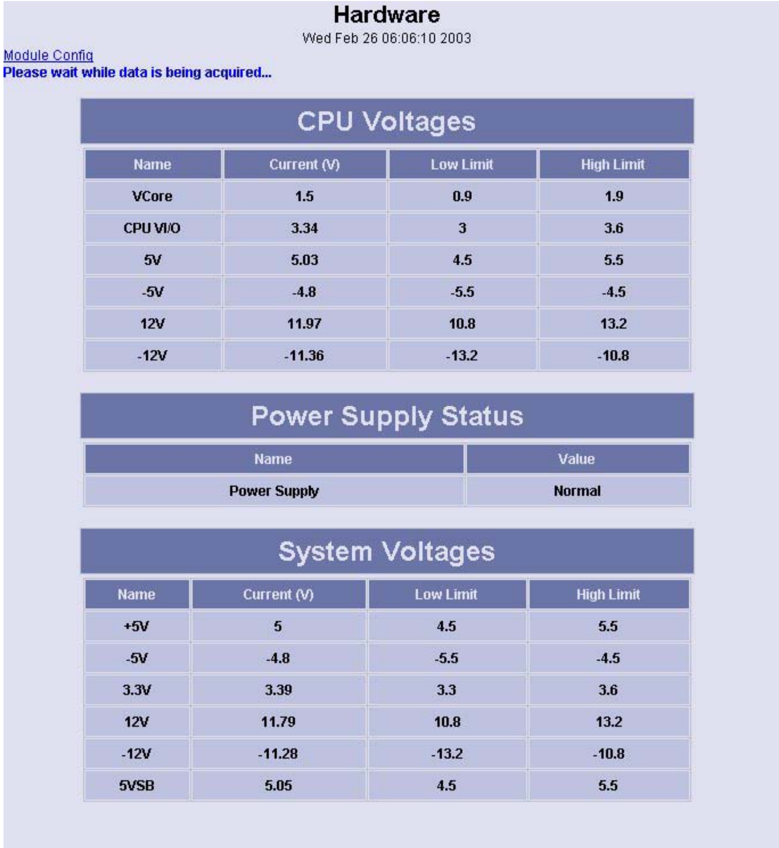
Power

1. Access and log into the Webmin application according to "Webmin Logons" on page 2-21.
2. Click the *Diagnostics* tab.
3. Click the *Hardware* link.
4. Click the *Power* link.

The Power Diagnostics page displays real-time power supply status, and real-time CPU and System power levels. Power levels must be between the *High*- and *Low Limit* levels displayed.



Hardware

Wed Feb 26 06:06:10 2003

Module Config

Please wait while data is being acquired...

CPU Voltages

Name	Current (V)	Low Limit	High Limit
VCore	1.5	0.9	1.9
CPU VI/O	3.34	3	3.6
5V	5.03	4.5	5.5
-5V	-4.8	-5.5	-4.5
12V	11.97	10.8	13.2
-12V	-11.36	-13.2	-10.8

Power Supply Status

Name	Value
Power Supply	Normal

System Voltages

Name	Current (V)	Low Limit	High Limit
+5V	5	4.5	5.5
-5V	-4.8	-5.5	-4.5
3.3V	3.39	3.3	3.6
12V	11.79	10.8	13.2
-12V	-11.28	-13.2	-10.8
5VSB	5.05	4.5	5.5

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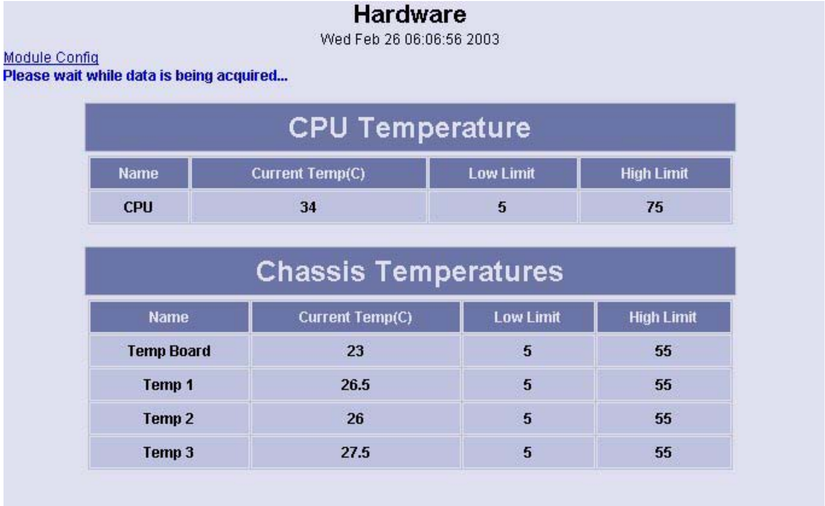
Temperature

1. Access and log into the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Diagnostics* tab.
3. Click the *Hardware* link.
4. Click the *Temperatures* link.

The Temperatures page displays real-time ApexPro Telemetry Server internal temperature information. Temperatures must be between the *High*- and *Low Limit* levels displayed.



Please wait while data is being acquired...

CPU Temperature

Name	Current Temp(C)	Low Limit	High Limit
CPU	34	5	75

Chassis Temperatures

Name	Current Temp(C)	Low Limit	High Limit
Temp Board	23	5	55
Temp 1	26.5	5	55
Temp 2	26	5	55
Temp 3	27.5	5	55

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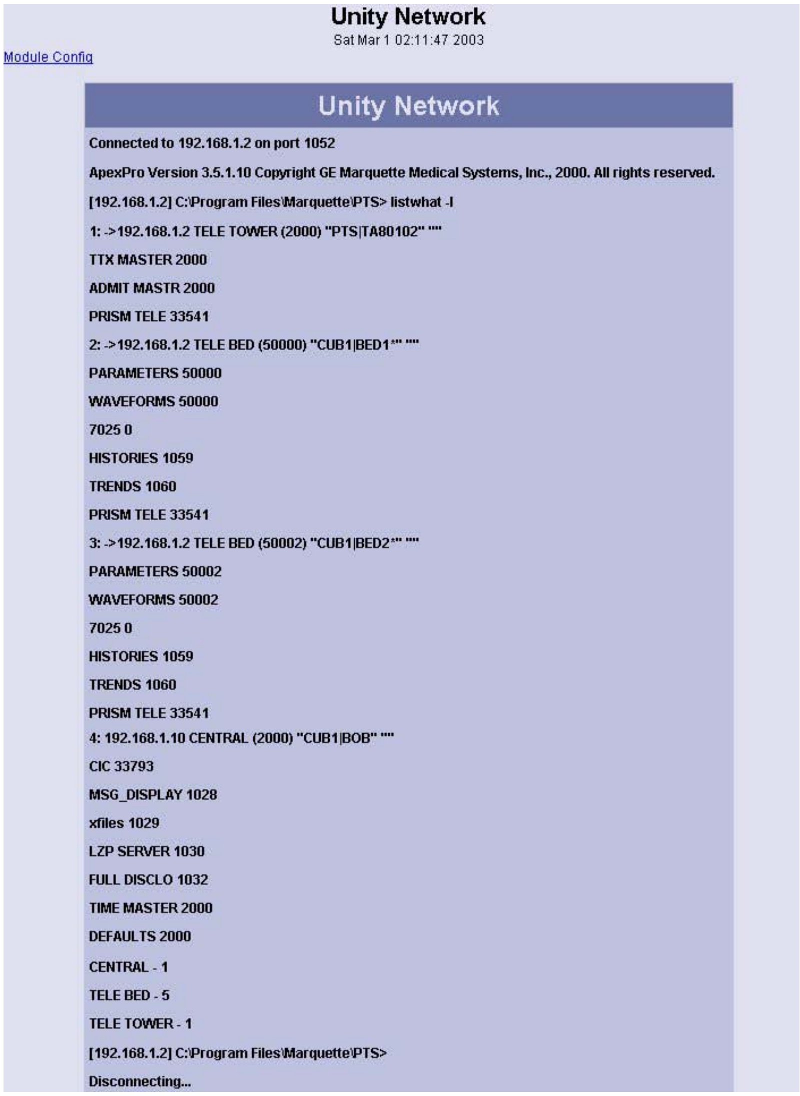
Unity Network Device Detection

1. Access and log into the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Diagnostics* tab.
3. Click the *Unity Network* link.

The *Unity Network* page displays a provides a list and summary of all devices that are communicating over the network.



```
Connected to 192.168.1.2 on port 1052
ApexPro Version 3.5.1.10 Copyright GE Marquette Medical Systems, Inc., 2000. All rights reserved.
[192.168.1.2] C:\Program Files\Marquette\PTS> listwhat -l
1: ->192.168.1.2 TELE TOWER (2000) "PTS|TA80102" ""
TTX MASTER 2000
ADMIT MASTR 2000
PRISM TELE 33541
2: ->192.168.1.2 TELE BED (50000) "CUB1|BED1*" ""
PARAMETERS 50000
WAVEFORMS 50000
7025 0
HISTORIES 1059
TRENDS 1060
PRISM TELE 33541
3: ->192.168.1.2 TELE BED (50002) "CUB1|BED2*" ""
PARAMETERS 50002
WAVEFORMS 50002
7025 0
HISTORIES 1059
TRENDS 1060
PRISM TELE 33541
4: 192.168.1.10 CENTRAL (2000) "CUB1|BOB" ""
CIC 33793
MSG_DISPLAY 1028
xfiles 1029
LZP SERVER 1030
FULL DISCLO 1032
TIME MASTER 2000
DEFAULTS 2000
CENTRAL - 1
TELE BED - 5
TELE TOWER - 1
[192.168.1.2] C:\Program Files\Marquette\PTS>
Disconnecting...
```

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A typical listing might include the following data:

IP Address	Device Type	Secondary Address	Care Unit: Device Name	Patient Name
126.0.17.206	TELE TOWER	(2000)	“SICU: TOWR7e0011	
126.0.17.206	TELE BED	(2001)	“SICU:214-A”	“JACKSON”

IP Address	Device Type	Secondary Address	Care Unit: Device Name	Patient Name
126.0.6.77	TRAMSCOPE	(2000)	“ICU:BED1”	“HUNTER”
126.0.6.61	TRAMSCOPE	(2000)	“ICU:BED4”	“BLAND”
126.0.177.21	CENTRAL	(2000)	“ICU:CS4”	

- IP Address — Uniquely identifies each device on the network, whether the devices are manufactured by GE Medical Systems *Information Technologies*, or are part of the hospital information system.
- Device Type — Includes:
  - CENTRAL: Centralscope central station/CIC Pro
  - MONITOR: Eagle, Solar, Tramscope monitors
  - MRT2: Monitoring Review Terminal 2
  - MUSE: MUSE system
  - TELE BED: Telemetry bed, CD, or APEX
  - TELE TOWER: Telemetry cabinet

Accessing Service Utilities

WARNING
LOSS OF FUNCTION/EQUIPMENT DAMAGE/LOSS OF DATA — The Service Utilities are intended for use ONLY by qualified personnel with training and experience with their use. Do NOT “experiment” with any commands other than those shown in this manual. The consequences of misuse include loss of patient data, corruption of CIC Pro or operating system software, or disruption of the entire Unity Network MC network.

The Service Utilities provide several advanced and specialized functions for configuring and troubleshooting the ApexPro Telemetry Server.

For more information about ApexPro Telemetry Server service utilities, see “Service Utilities” on page 2-18.

Event Logs

For more information about logs, and retrieving log files, refer to the following:

- “ApexPro Telemetry Server Log Files” on page 5-20.
- “View Logs” on page 5-20.
- “Download Logs” on page 5-21.

ApexPro Telemetry Server Log Files

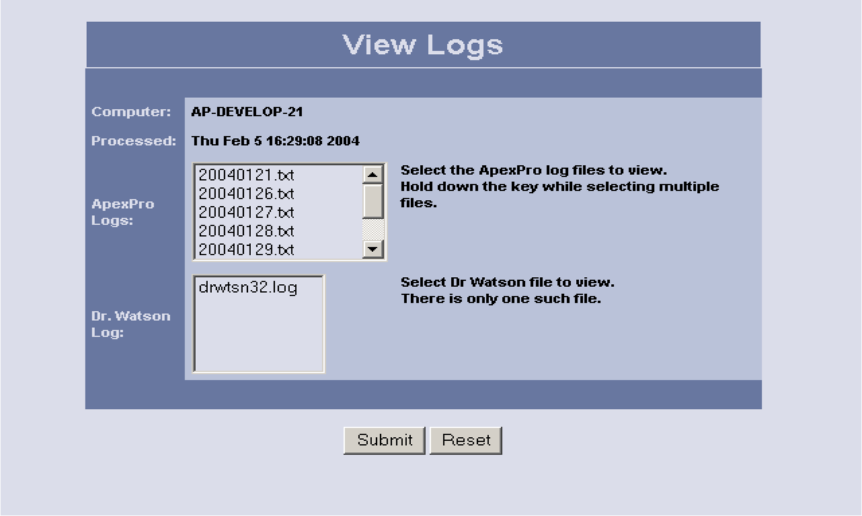
NOTE

ApexPro Telemetry Server logs are located in the *c:\Program Files\Marquette\PTS\log* directory.

View Logs

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Diagnostics* tab.
3. Click the *Logs* link under the *Diagnostics* menu along the left side of the window. Two links display under the *Logs* link: *Download* and *View*.
4. Click the *View* link.

Use this window to view ApexPro and Windows Dr. Watson log files, as follows:



View Logs

Computer: AP-DEVELOP-21

Processed: Thu Feb 5 16:29:08 2004

ApexPro Logs:

20040121.txt
20040126.txt
20040127.txt
20040128.txt
20040129.txt

Select the ApexPro log files to view.
Hold down the key while selecting multiple files.

Dr. Watson Log:

drwtsn32.log

Select Dr Watson file to view.
There is only one such file.

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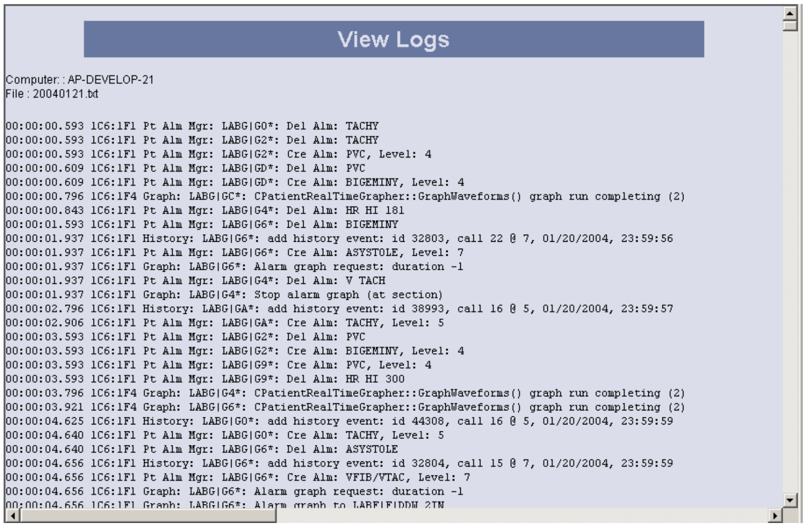
5. Select the log files you want to view from the *ApexPro Logs* and/or *Dr. Watson Log* lists. Click *Reset* to deselect all files.

   NOTE

   Ctrl + click to select multiple items from the lists.

6. Click *Submit*. The selected log files display.



View Logs

Computer: : AP-DEVELOP-21
File : 20040121.txt

```
00:00:00.593 1C6:1F1 Pt Alm Mgr: LABG|G0*: Del Alm: TACHY
00:00:00.593 1C6:1F1 Pt Alm Mgr: LABG|G2*: Del Alm: TACHY
00:00:00.593 1C6:1F1 Pt Alm Mgr: LABG|G2*: Cre Alm: PVC, Level: 4
00:00:00.609 1C6:1F1 Pt Alm Mgr: LABG|GD*: Del Alm: PVC
00:00:00.609 1C6:1F1 Pt Alm Mgr: LABG|GD*: Cre Alm: BIGEMINY, Level: 4
00:00:00.796 1C6:1F4 Graph: LABG|GC*: CPatientRealTimeGrapher::GraphWaveforms() graph run completing (2)
00:00:00.843 1C6:1F1 Pt Alm Mgr: LABG|G4*: Del Alm: HR HI 181
00:00:01.593 1C6:1F1 Pt Alm Mgr: LABG|G6*: Del Alm: BIGEMINY
00:00:01.937 1C6:1F1 History: LABG|G6*: add history event: id 32803, call 22 @ 7, 01/20/2004, 23:59:56
00:00:01.937 1C6:1F1 Pt Alm Mgr: LABG|G6*: Cre Alm: ASYSTOLE, Level: 7
00:00:01.937 1C6:1F1 Graph: LABG|G6*: Alarm graph request: duration -1
00:00:01.937 1C6:1F1 Pt Alm Mgr: LABG|G4*: Del Alm: V TACH
00:00:01.937 1C6:1F1 Graph: LABG|G4*: Stop alarm graph (at section)
00:00:02.796 1C6:1F1 History: LABG|GA*: add history event: id 38993, call 16 @ 5, 01/20/2004, 23:59:57
00:00:02.906 1C6:1F1 Pt Alm Mgr: LABG|GA*: Cre Alm: TACHY, Level: 5
00:00:03.593 1C6:1F1 Pt Alm Mgr: LABG|G2*: Del Alm: PVC
00:00:03.593 1C6:1F1 Pt Alm Mgr: LABG|G2*: Cre Alm: BIGEMINY, Level: 4
00:00:03.593 1C6:1F1 Pt Alm Mgr: LABG|G9*: Cre Alm: PVC, Level: 4
00:00:03.593 1C6:1F1 Pt Alm Mgr: LABG|G9*: Del Alm: HR HI 300
00:00:03.796 1C6:1F4 Graph: LABG|G4*: CPatientRealTimeGrapher::GraphWaveforms() graph run completing (2)
00:00:03.921 1C6:1F4 Graph: LABG|G6*: CPatientRealTimeGrapher::GraphWaveforms() graph run completing (2)
00:00:04.625 1C6:1F1 History: LABG|G0*: add history event: id 44308, call 16 @ 5, 01/20/2004, 23:59:59
00:00:04.640 1C6:1F1 Pt Alm Mgr: LABG|G0*: Cre Alm: TACHY, Level: 5
00:00:04.640 1C6:1F1 Pt Alm Mgr: LABG|G6*: Del Alm: ASYSTOLE
00:00:04.656 1C6:1F1 History: LABG|G6*: add history event: id 32804, call 15 @ 7, 01/20/2004, 23:59:59
00:00:04.656 1C6:1F1 Pt Alm Mgr: LABG|G6*: Cre Alm: VFIB/VTAC, Level: 7
00:00:04.656 1C6:1F1 Graph: LABG|G6*: Alarm graph request: duration -1
00:00:04.656 1C6:1F1 Graph: LABG|G6*: Alarm graph to
```

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Download Logs

NOTE

At the end of each day, log files are compressed into.*bfp* files. Because of this, current day log files are uncompressed. Uncompressed files cannot be downloaded using the *Download Logs* window. To view and download current day log files, see “View Logs” on page 5-20.

NOTE

Saved logs are compressed into a *.zip formatted file. A.zip file utility, such as PKZIP is required to open the downloaded file.

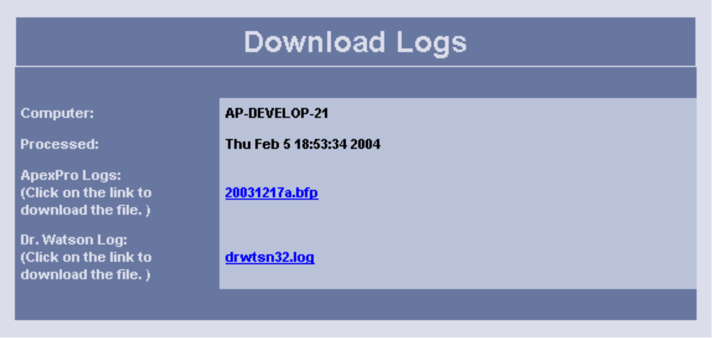
Use the Webmin application to download logs as follows:

1. Log in to the Webmin application according to "Webmin Logons" on page 2-21.
2. Click the *Diagnostics* tab.
3. Click the *Logs* link under the *Diagnostics* menu along the left side of the window. Two links display under the *Logs* link: *Download* and *View*.
4. Click the *Download* link.
5. Click to select the logs you want to download. Click *Reset* to deselect all logs.

   NOTE

   Ctrl + click to select multiple items from the lists.

6. Click *Submit*. A new window containing links for downloading the selected logs displays.



Download Logs

Computer: AP-DEVELOP-21

Processed: Thu Feb 5 18:53:34 2004

ApexPro Logs: (Click on the link to download the file.) 20031217a.bfp

Dr. Watson Log: (Click on the link to download the file.) drwtsn32.log

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7. Click a log you want to download. The *File Download* window displays.
8. Click *Save*. The *Save As* window displays.
9. Navigate to a location to save the log, and type a name for the logs, or accept the default. Click *Save*.
10. Close the *Download complete* window in one of the following ways:
    a. To open the downloaded file, click *Open*.
    b. To open the Windows Explorer folder where the file was saved, click *Open Folder.*
    c. Click *Close* to close the *Download complete* window without performing any additional tasks.

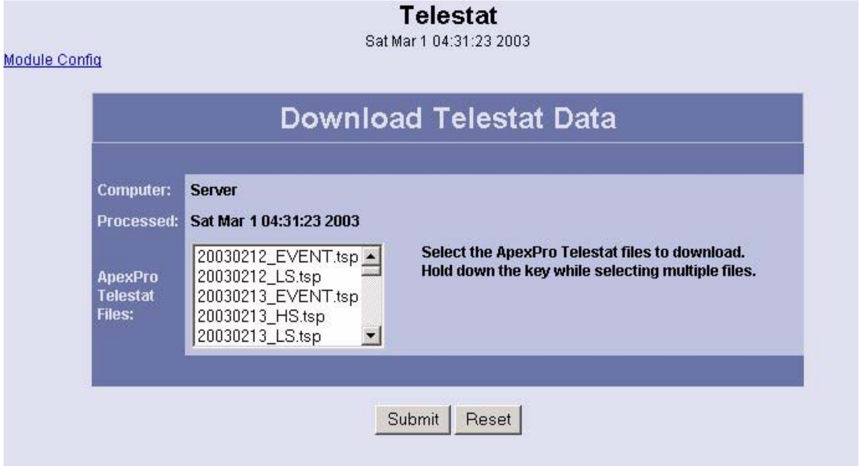
Download Telestat Logs

NOTE

Saved logs are compressed into a *.zip formatted file. A.zip file utility, such as PKZIP is required to open the downloaded file.

Telemetry statistics (Telestat) logs are useful when troubleshooting communication problems between devices in the telemetry system.

1. Log in to the Webmin application according to “Webmin Logons” on page 2-21.
2. Click the *Diagnostics* tab.
3. Click the *Telestat* link under the *Diagnostics* menu along the left side of the window.



Telestat

Sat Mar 1 04:31:23 2003

Module Config

Download Telestat Data

Computer: Server

Processed: Sat Mar 1 04:31:23 2003

ApexPro Telestat Files:

20030212_EVENT.tsp
20030212_LS.tsp
20030213_EVENT.tsp
20030213_HS.tsp
20030213_LS.tsp

Select the ApexPro Telestat files to download.
Hold down the key while selecting multiple files.

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4. Click to select the logs you want to download. Click *Reset* to deselect selected logs.

   NOTE

   Ctrl + click to select multiple items from the lists.

5. Click *Submit*. A new window containing links for downloading the selected logs displays.
6. Click a log you want to download.
7. Click *Save*. The *Save As* window displays.
8. Navigate to a location to save the log, and type a name for the logs, or accept the default. Click *Save*.
9. Close the *Download complete* window in one of the following ways:
   a. To open the downloaded file, click *Open*.
   b. To open the Windows Explorer folder where the file was saved, click *Open Folder.*
   c. Click *Close* to close the *Download complete* window without performing any additional tasks.
   d. Select the *Close this dialog box when download completes*, and the *Download complete* window closes automatically when the download operation is finished.

For your notes

6

Parts Lists, Drawings and Replacement

For your notes

Field Replacement Units (FRUs)

For FRU disassembly/assembly information see "Disassembly/Assembly" on page 6-4.

Part Number	Item Description
2021512-007	ATS Hard Drive
2021512-002	ATS Power Supply
2021512-003	ATS CPU Assembly
2021512-013	ATS CPU Fan
2021512-004	ATS Network Card
2021512-005	ATS RAID Card
2021512-014	ATS CD ROM and Cable
2021512-015	ATS Chassis Fan Assembly
2021512-011	ATS Chassis Fan Filter
2021512-012	ATS Hard Drive Filter
2021512-008	ATS SNMP Battery Assembly
2021512-009	ATS SNMP Processor Board
2021512-010	ATS Temperature Sensor

Optional Components

Item Number	Item Description
2022038-001	Power Supply UPS 600VA 120 Volts
2022038-002	Power Supply UPS 600VA 220 Volts
2012260-001	Power Supply UPS 750VA 120 Volts
2012260-002	Power Supply UPS 750VA 220 Volts
2022038-003	Power Supply UPS 2000VA 120 Volts
2022431-001	Front/Mid Tower Brackets
2022432-001	Tower Mount Stand
2022433-001	18" Rack Mount Slides (Pair)
2022433-002	20" Rack Mount Slides (Pair)
2022433-003	22" Rack Mount Slides (Pair)
2022433-004	24" Rack Mount Slides (Pair)

Disassembly/Assembly

Field Replacement Procedures

WARNING
EQUIPMENT DAMAGE/PERSONAL INJURY — Complete "Field Replacement Preparation" on page 6-5 before performing any other procedure in this chapter. Failure to follow this instruction could result in equipment damage or personal injury.

Field replacement information for the following components are included in this chapter:

- "Field Replacement Preparation" on page 6-5
- "Fan Filter" on page 6-7
- "Drive Filter" on page 6-9
- "RAID Card" on page 6-12
- "Network Card" on page 6-16
- "SNMP Boards" on page 6-18
- "SNMP Battery" on page 6-24
- "If applicable, perform the "Electrical Safety Tests" on page 4-10." on page 6-26
- "Hard Drive" on page 6-30
- "CD ROM Drive" on page 6-34
- "CPU Fan" on page 6-36
- "Chassis Fan" on page 6-38
- "CPU Boards" on page 6-39
- "Power Module" on page 6-50
- "Temperature Sensor" on page 6-52

Field Replacement Preparation

WARNINGS

LOSS OF FUNCTION/EQUIPMENT DAMAGE — Only a qualified service technician should perform the procedures in this chapter. Failure to follow this instruction could result in loss of ApexPro Telemetry Server and/or equipment damage.

SHOCK WARNING —The ApexPro Telemetry Server remains energized for a period of time after shutdown. Wait several minutes after shutdown before proceeding. The on/off button behind the front service door in the front panel does not turn off the system AC power. To remove power from the server, you must unplug the AC power cord from the wall outlet or power cord connector on the server. Failure to follow this instruction could result in electrical shock.

CAUTION

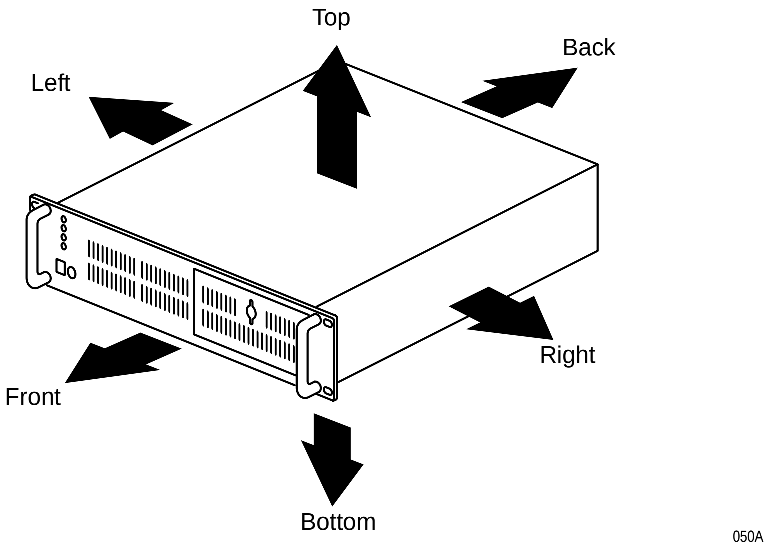
EQUIPMENT DAMAGE — An antistatic wrist strap is include with all ApexPro Telemetry Server field replacement kits. Always provide electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to the chassis ground of the system (any unpainted metal surface) whenever handling ApexPro Telemetry Server internal components. The ApexPro Telemetry Server is extremely static sensitive and should be handled using precautions to prevent damage caused by electrostatic discharge. Failure to follow this instruction could result in equipment damage.

Observe these safety guidelines before opening the ApexPro Telemetry Server case.

1. Turn the ApexPro Telemetry Server off, and unplug the AC power cord from the back of the server and from the wall outlet.
2. Turn off all connected peripheral devices.
3. Label and disconnect all peripheral cables and telecommunication lines connected to the I/O connectors or ports at back of the server.
4. Read and follow the instructions in “Controlling Electrostatic Discharge Damage” on page 4-9.

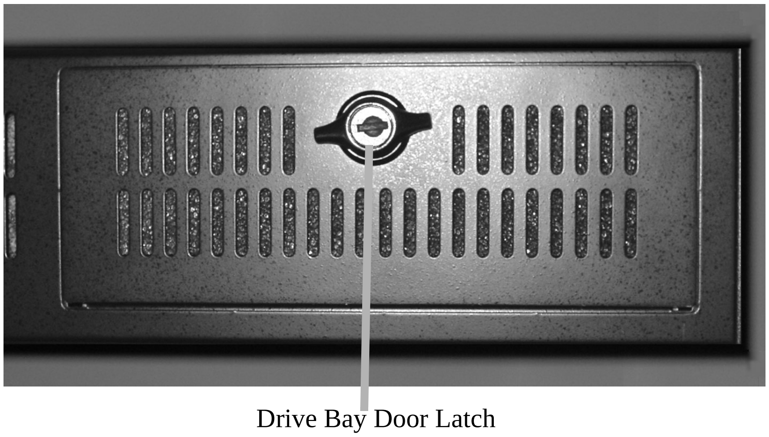
FRU Orientation

The following figure illustrates front, back, left and right orientation referred to throughout the field replacement procedures.


Top
Back
Left
Right
Front
Bottom
050A

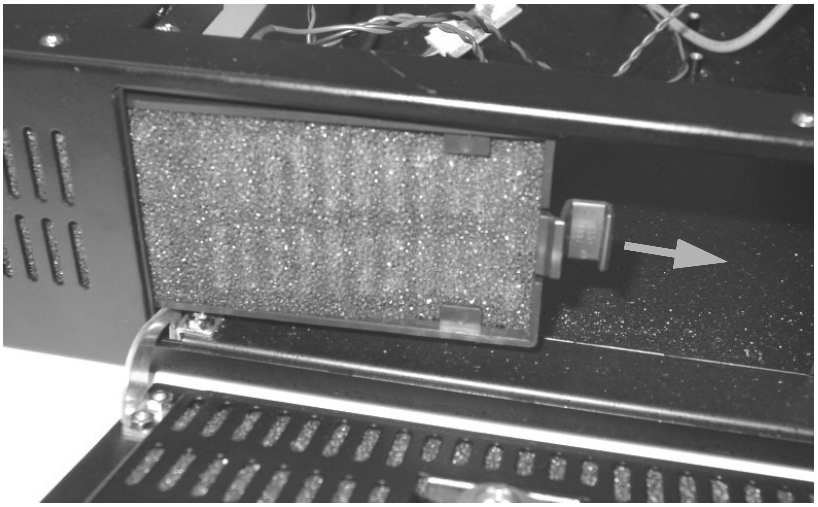
Fan Filter

1. Turn the latch securing the front service door on the front panel of the ApexPro Telemetry Server and open the door.



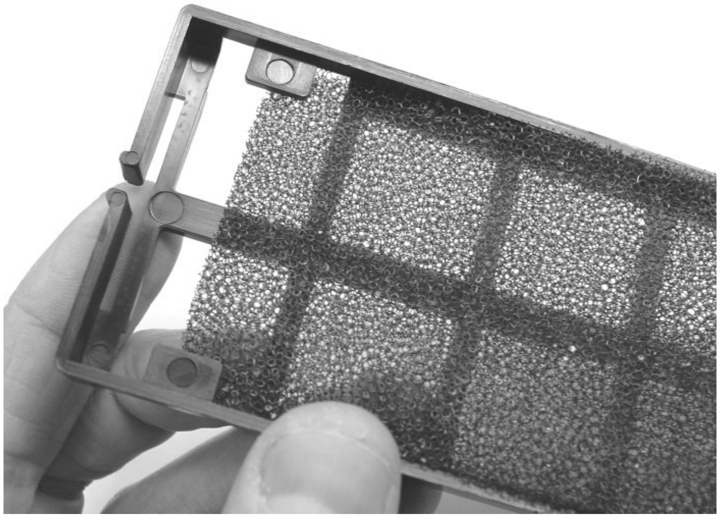
203A

2. Slide the filter frame out of the service opening.



011A

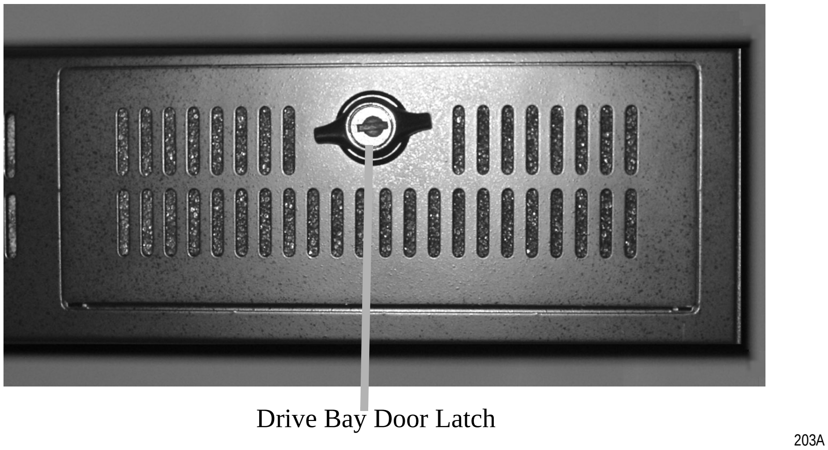
3. Remove the foam filter from the filter frame.



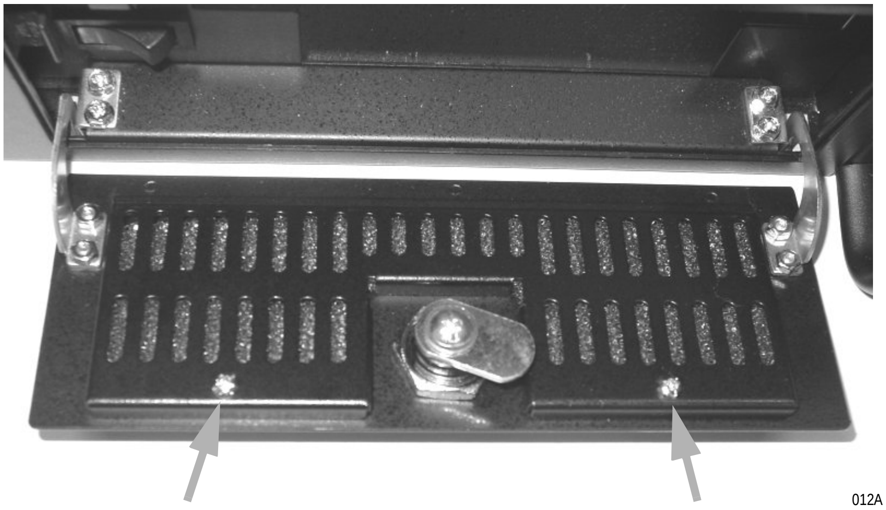
4. Reverse the steps in this procedure to install the fan filter.

Drive Filter

1. Turn the latch securing the front service door on the front panel of the ApexPro Telemetry Server and open the door.



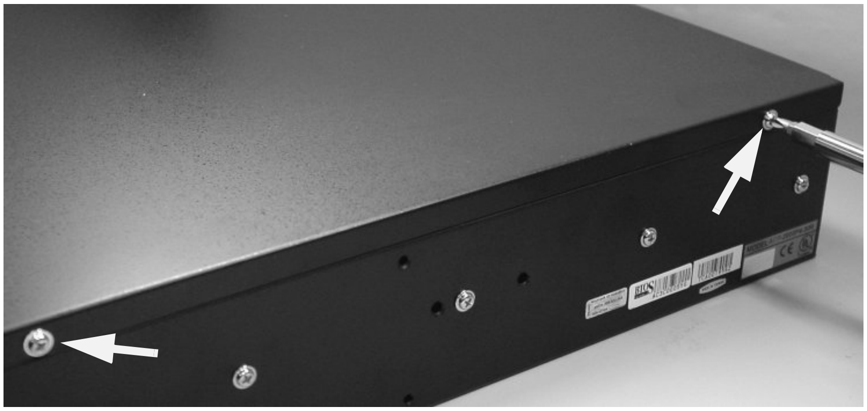
2. Using a phillips screwdriver, remove the two screws securing the drive filter cover.



3. Remove the cover and filter.
4. Reverse the steps in this procedure to install the drive filter.

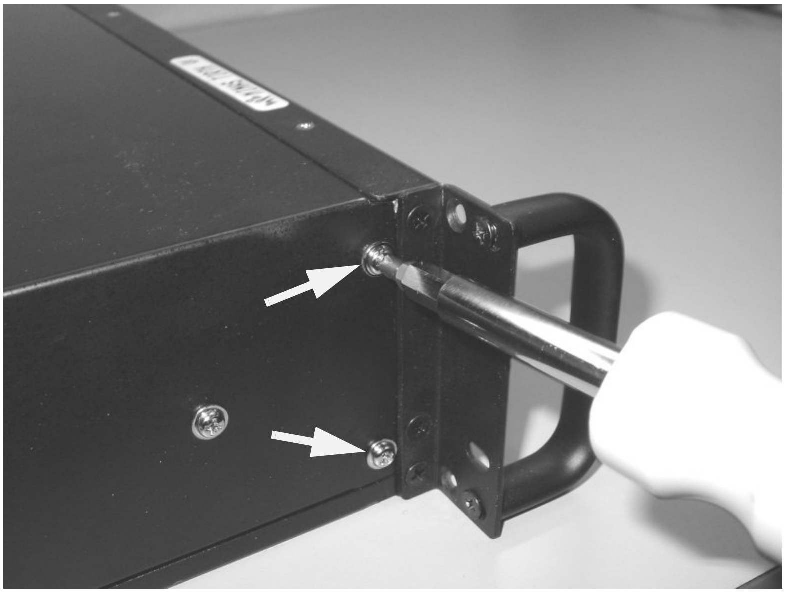
Chassis Cover

1. Complete the procedures in “Field Replacement Preparation” on page 6-5.
2. Using a phillips screwdriver, remove the 2 screws securing the right side of the cover.



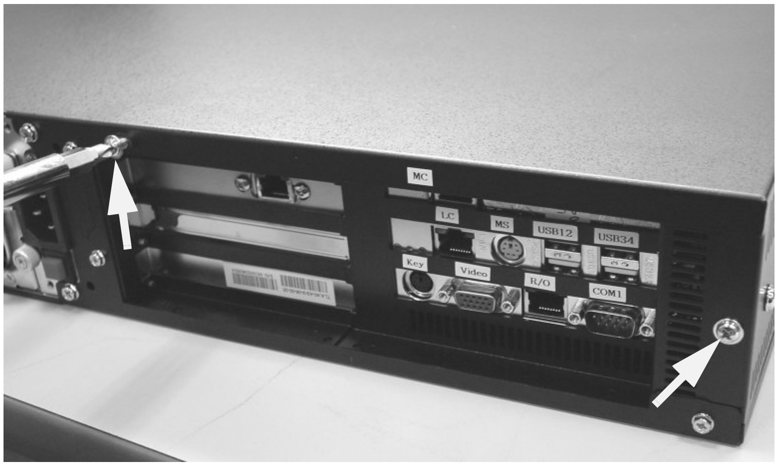
041A

3. Using a phillips screwdriver, remove the 2 screws securing the left front side of the cover.



167A

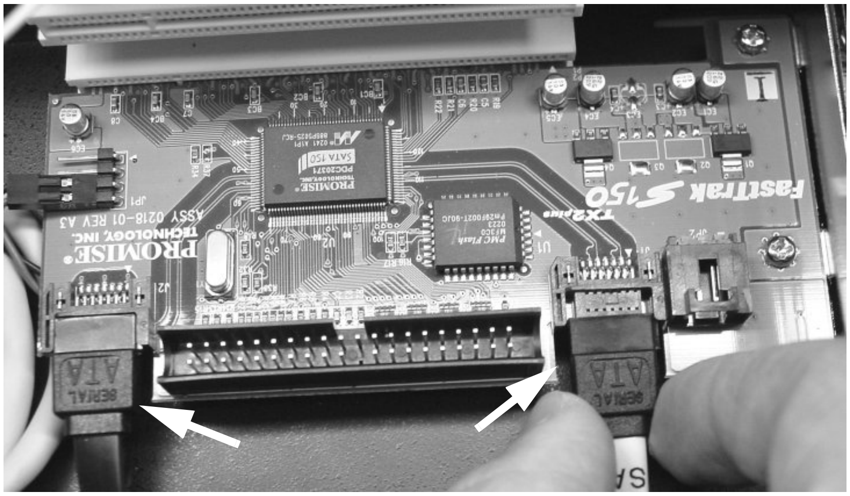
4. Using a phillips screwdriver, remove the 2 screws securing the back side of the cover.



5. Slide the cover backwards until the lip on the front of the cover clears the groove in the chassis. Lift and remove the cover.
6. Reverse the steps in this procedure to install the chassis cover.

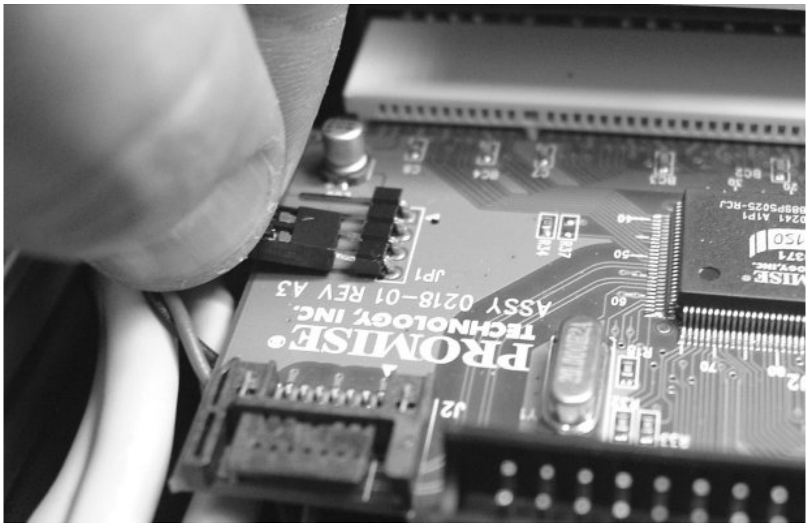
RAID Card

1. Complete “Field Replacement Preparation” on page 6-5l.
2. Remove the chassis cover according to “Chassis Cover” on page 6-10.
3. Disconnect the hard drive ATA serial cables from the RAID card.
4. If replacing the RAID card, remove the ATA serial cables from the connection ports at the back of the hard drives, and discard the cables. The RAID card FRU kit contains replacement ATA serial cables as well.



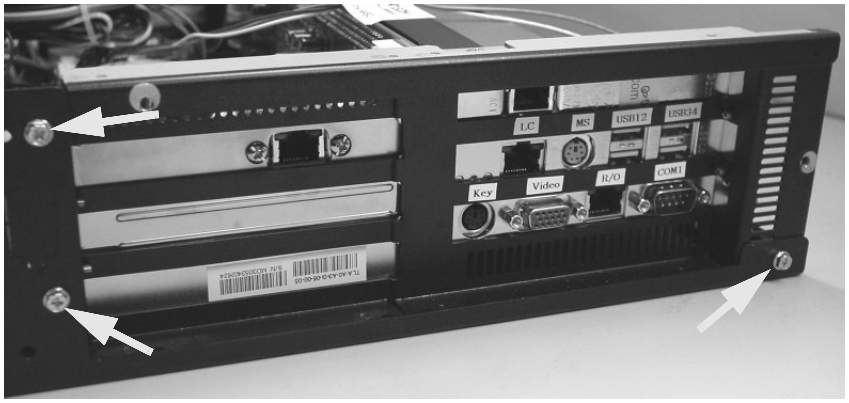
014A

5. Disconnect the LED connector from the front edge of the RAID card.



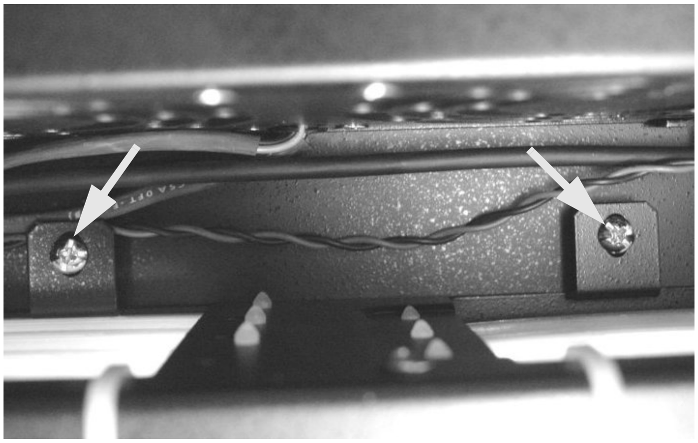
049A

6. Remove the 3 screws securing the back of the CPU module to the chassis.



046A

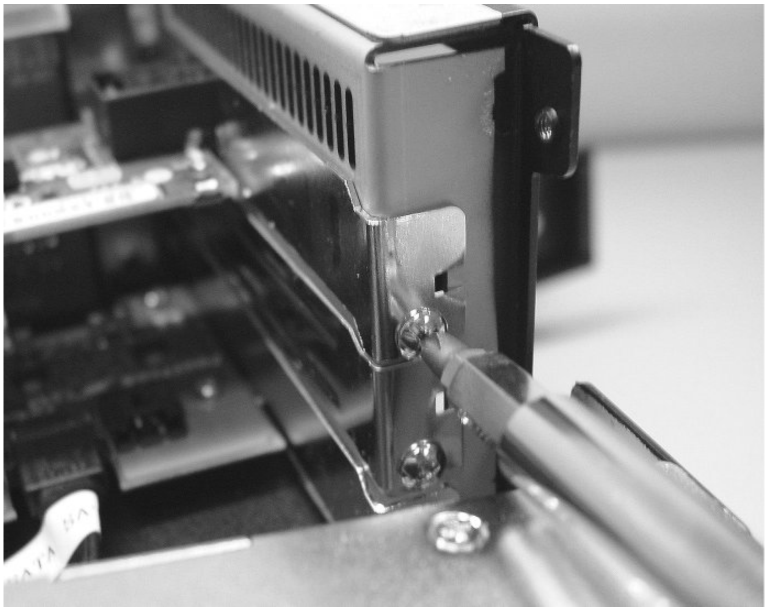
7. Remove the 2 screws securing the front of the CPU module to the chassis.



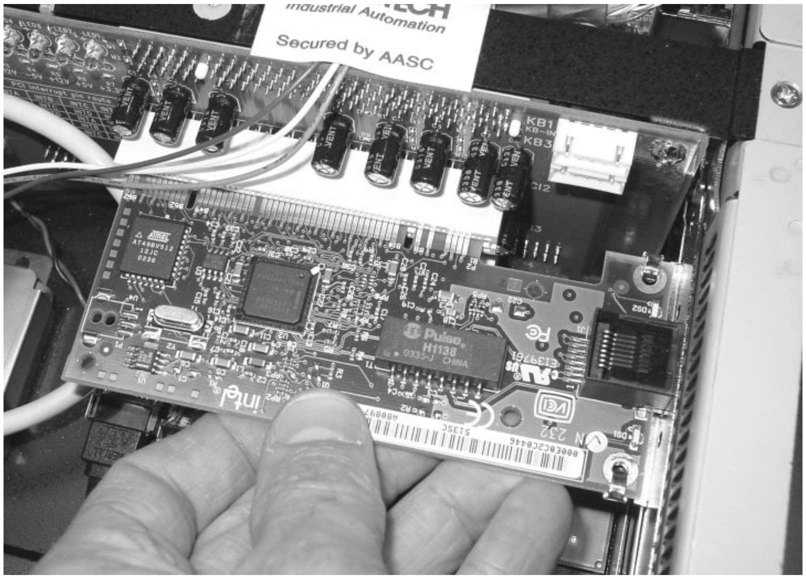
048A

8. Carefully move the CPU module far enough to allow card removal.

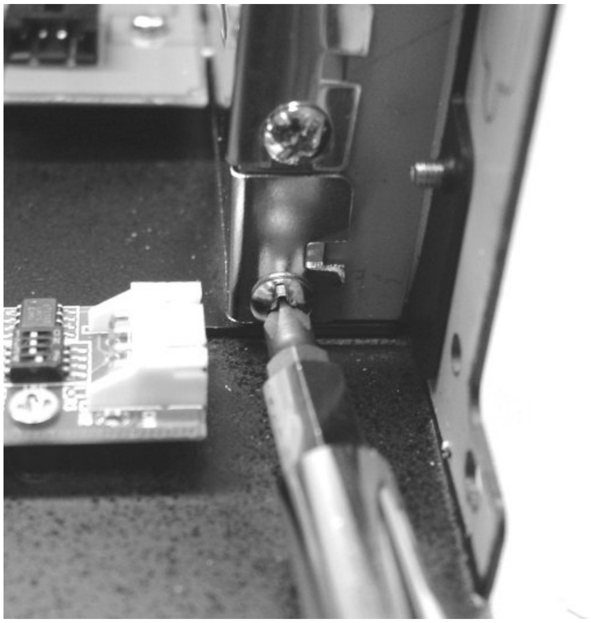
9. Using a phillips screwdriver, remove the screw securing the network card in the slot.



10. Remove the network card from the slot.

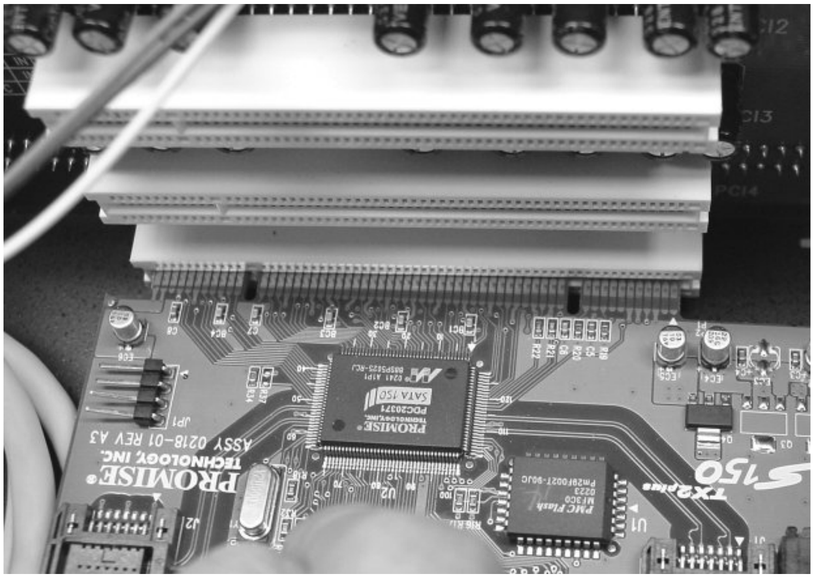


11. Using a phillips screwdriver, remove the screw securing the RAID card in the slot.



047A

12. Remove the RAID card from the slot.

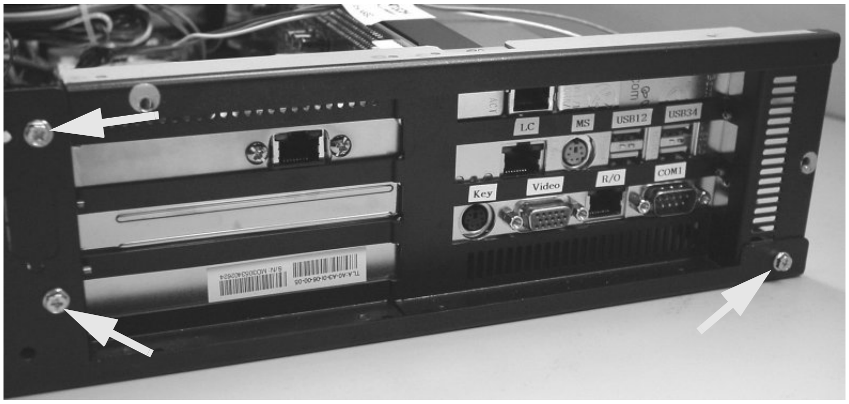


033A

13. Reverse the steps in this procedure to install the RAID card.
14. If applicable, perform the "Electrical Safety Tests" on page 4-10.

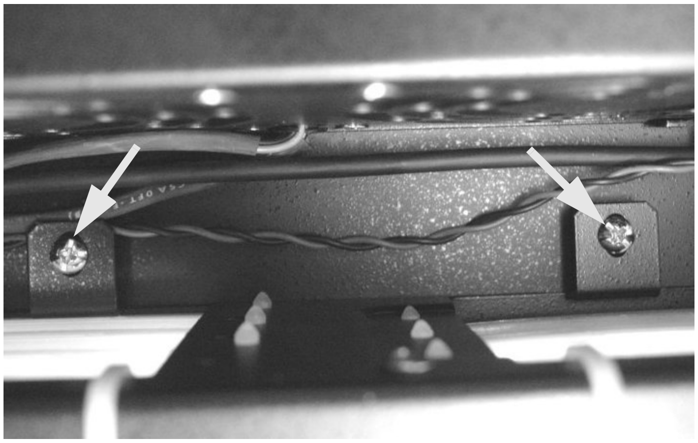
Network Card

1. Complete “Field Replacement Preparation” on page 6-5.
2. Disconnect the network cable plug from the connector at the back of the network card.
3. Remove the chassis cover according to “Chassis Cover” on page 6-10.
4. Remove the 3 screws securing the back of the CPU module to the chassis.



046A

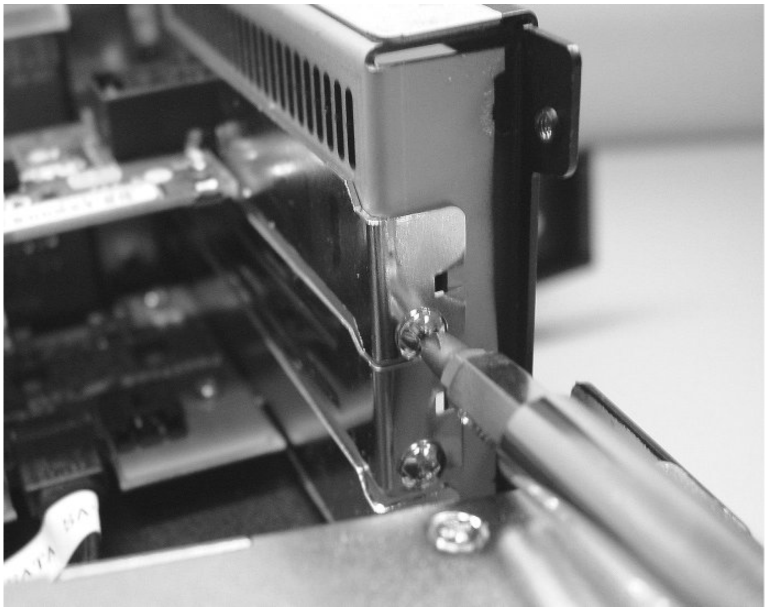
5. Remove the 2 screws securing the front of the CPU module to the chassis.



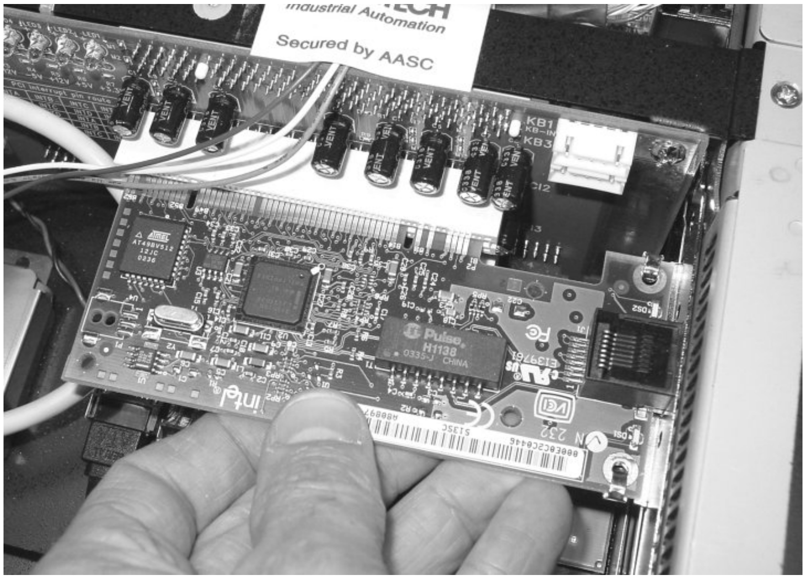
048A

6. Carefully move the CPU module far enough to allow card removal.

7. Using a phillips screwdriver, remove the screw securing the network card in the slot.



8. Remove the network card from the slot.

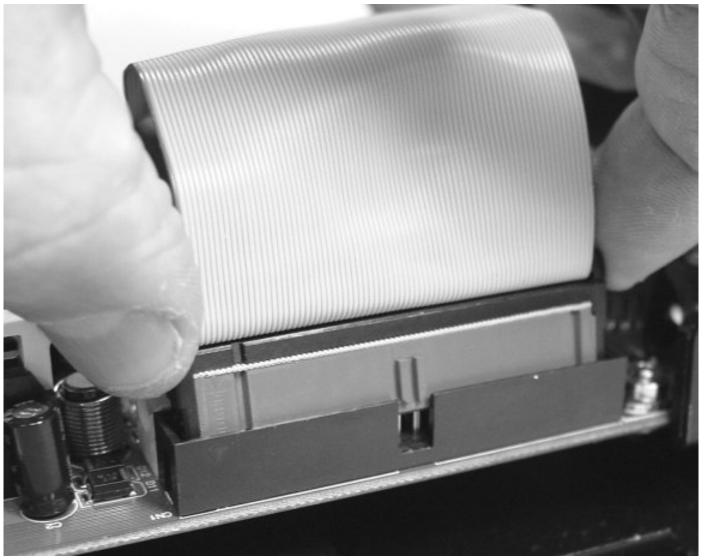


9. Reverse the steps in this procedure to install the network card.
10. If applicable, perform the “Electrical Safety Tests” on page 4-10.

SNMP Boards

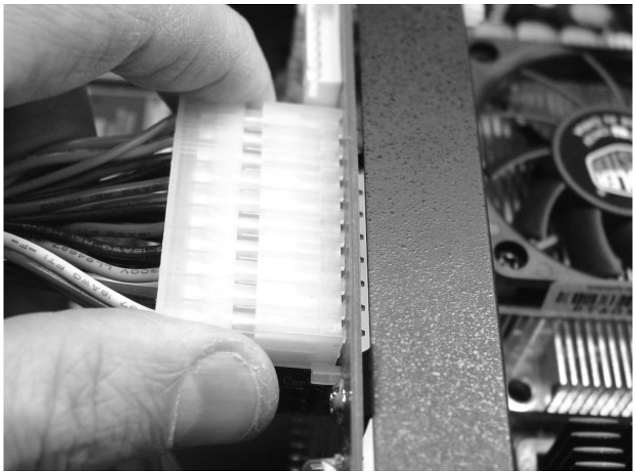
CAUTION
LOSS OF CONNECTIVITY — SNMP board replacement requires re-entry of serial number information. Improper ApexPro Telemetry Server serial number information will prevent remote services connection.

1. Complete "Field Replacement Preparation" on page 6-5.
2. Remove the chassis cover according to "Chassis Cover" on page 6-10.
3. Disconnect the CD data cable connector from the left edge of the CPU module. Move the CD data cable to out of the way to allow free access to the SNMP boards.



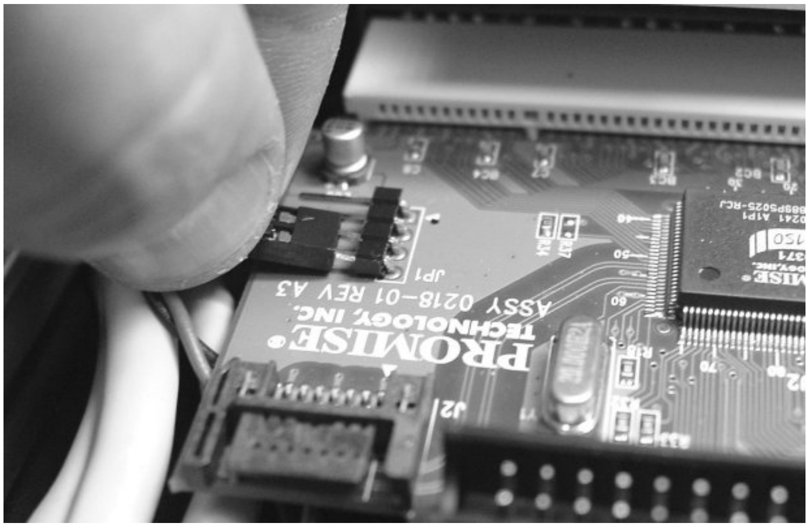
038A

4. Disconnect the power cable connector from the CPU module. Move the power cable to out of the way to allow free access to the SNMP boards.



040A

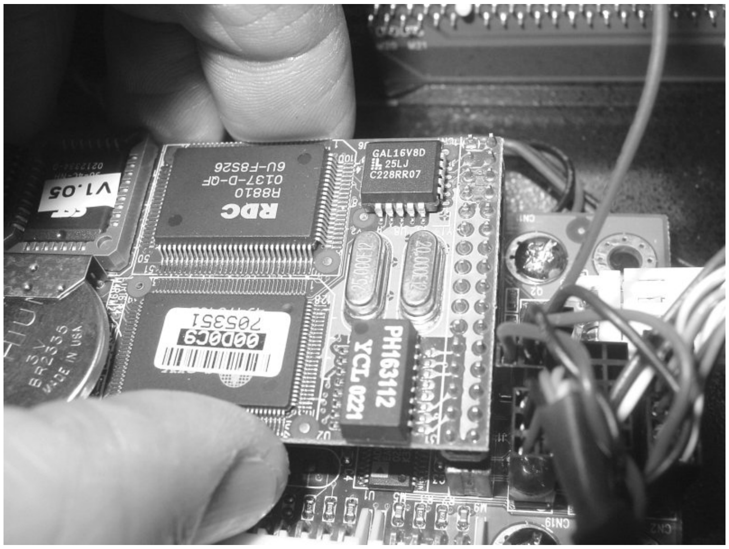
5. Disconnect the LED connector from the front edge of the RAID card. Note the position and orientation of the connector for reassembly.



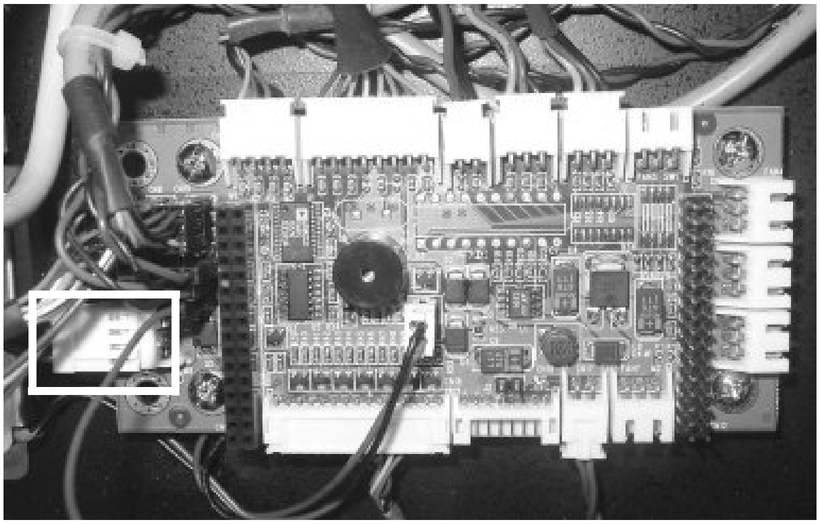
6. Unplug the SNMP extension board from the SNMP connection board.

NOTE

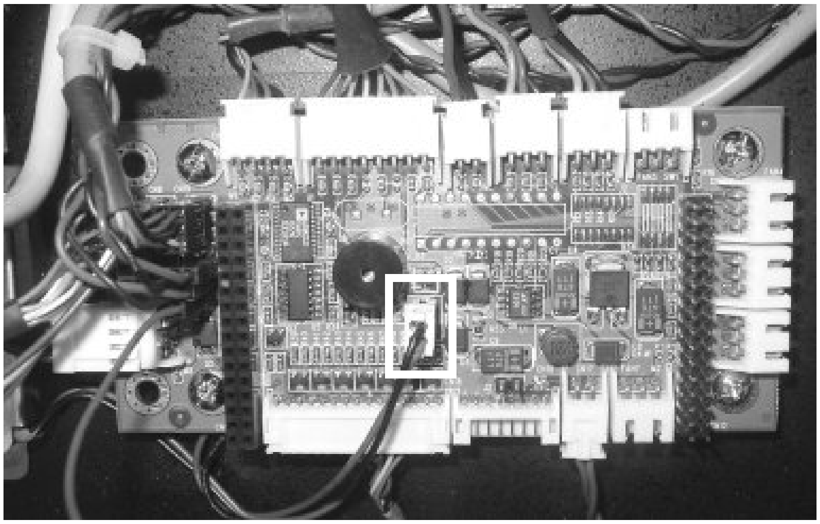
Gently wiggle the SNMP extension board to help remove it from the connection board.



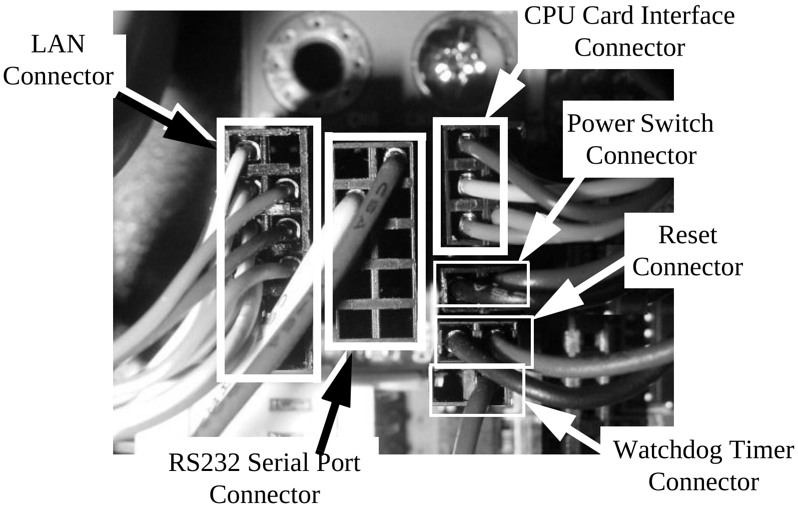
7. Disconnect the power connector from the receptacle on the back edge of the SNMP connector board.



8. Disconnect the battery connector from the receptacle on the top of the SNMP connector board.

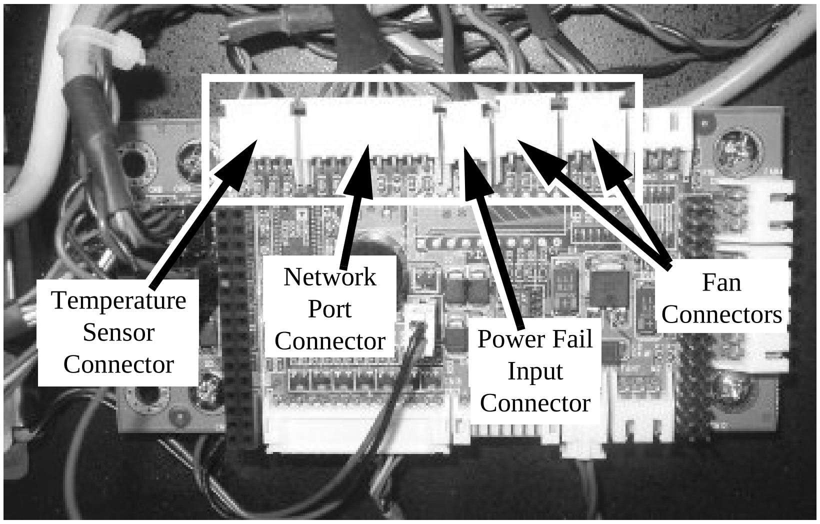


9. Disconnect the LAN, RS232 serial port, CPU interface card, power switch, reset, and watchdog timer connectors from the connection block near the back edge of the SNMP connection board. Note the position and orientation of the connectors for reassembly.


LAN Connector
CPU Card Interface Connector
Power Switch Connector
Reset Connector
Watchdog Timer Connector
RS232 Serial Port Connector

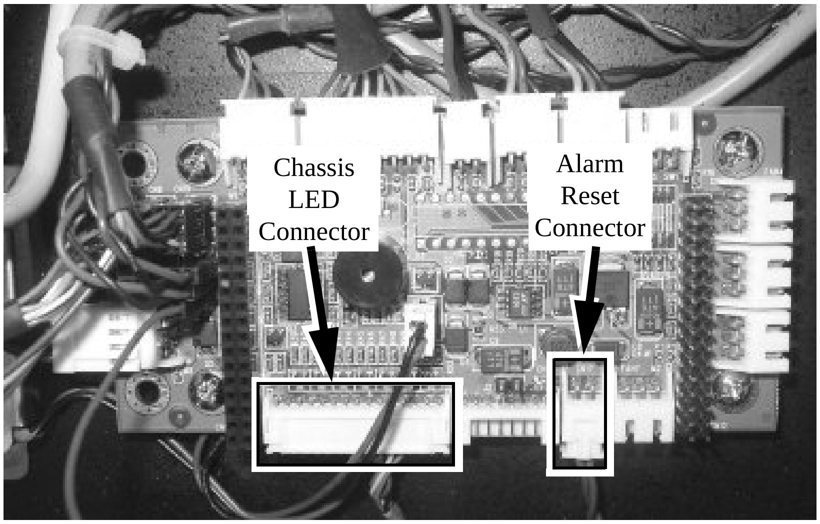
057A

10. Disconnect the temperature sensor, network port, power fail input, and fan connectors from the receptacles along the right edge of the SNMP connection board. Note the position and orientation of the connectors for reassembly.

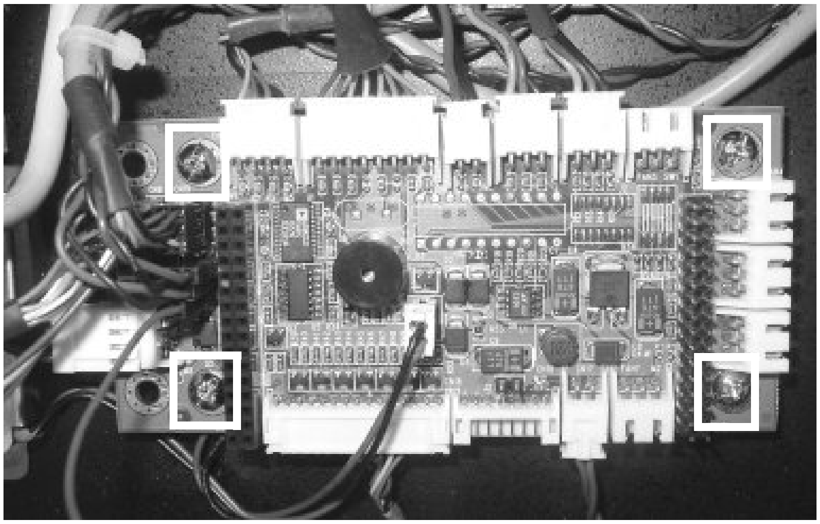

Temperature Sensor Connector
Network Port Connector
Power Fail Input Connector
Fan Connectors

022A

11. Disconnect the alarm reset, and the chassis LED connectors from the receptacles along the left edge of the SNMP connection board. Note the position and orientation of the connectors for reassembly.



12. Using a phillips screwdriver, remove the 4 screws securing the SNMP card to the chassis. Note the position and orientation of the connectors for reassembly.



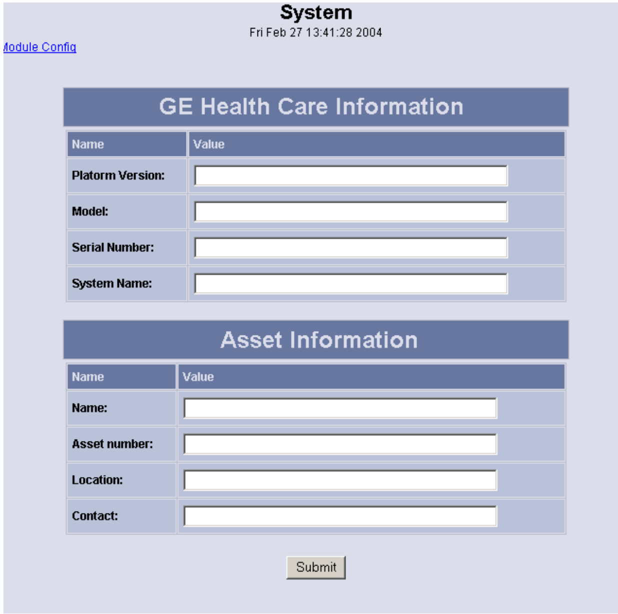
13. Remove the SNMP connection board.
14. Reverse the steps in this procedure to install the SNMP boards.

CAUTION

EQUIPMENT DAMAGE — Use extra care to make sure the pins are properly aligned before seating the SNMP extension board. Bent/broken pins may result if the pins are misaligned.

15. If applicable, perform the “Electrical Safety Tests” on page 4-10.

16. After the ApexPro Telemetry Server is restarted, log in to the Webmin application according to “Webmin Logons” on page 2-21.
17. Click the *Information* tab.
18. Click the *System* link under the *Information* menu along the left side of the window.



System

Fri Feb 27 13:41:28 2004

odule Config

GE Health Care Information

Name	Value
Platorm Version:	
Model:	
Serial Number:	
System Name:	

Asset Information

Name	Value
Name:	
Asset number:	
Location:	
Contact:	

122A

CAUTION

LOSS OF CONNECTIVITY — Improper serial number will cause loss of remote service connectivity.

19. Enter the proper serial number for the ApexPro Telemetry Server into the *Serial Number* field. Click *Submit*.

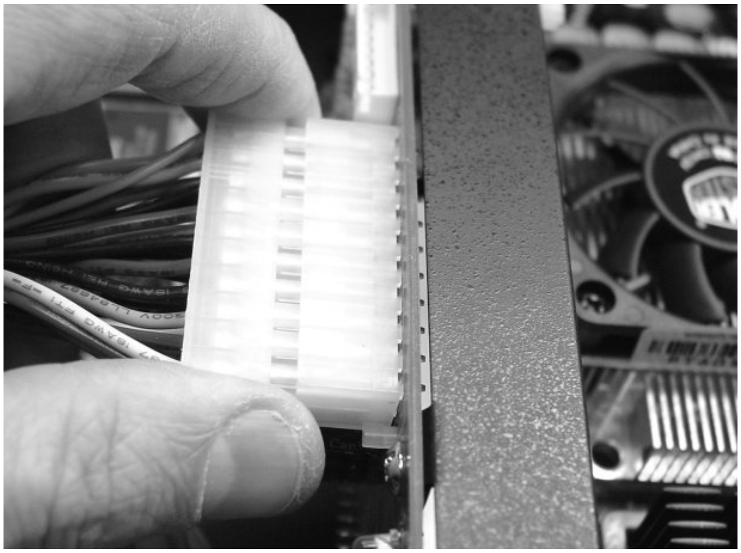
    NOTE

    The proper serial number is also printed on a label on the ApexPro Telemetry Server cover.

20. Change the label on the ApexPro Telemetry Server cover displaying the serial number.

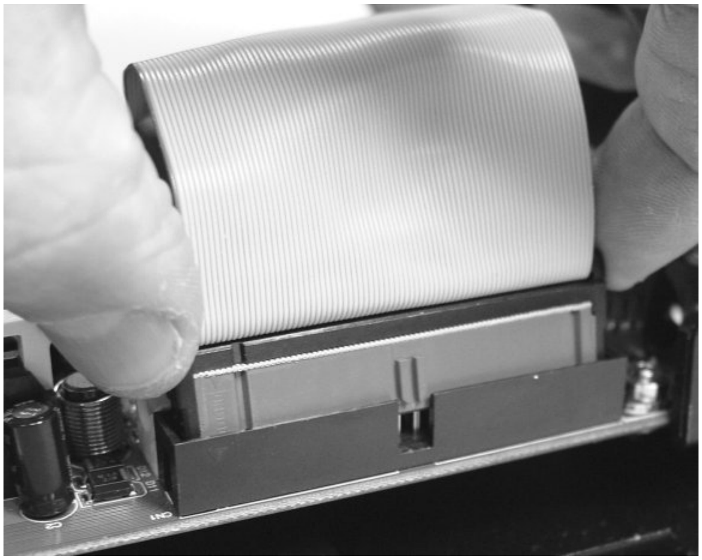
SNMP Battery

1. Complete “Field Replacement Preparation” on page 6-5
2. Remove the chassis cover according to “Chassis Cover” on page 6-10.
3. Disconnect the power cable connector from the receptacle on the CPU module.



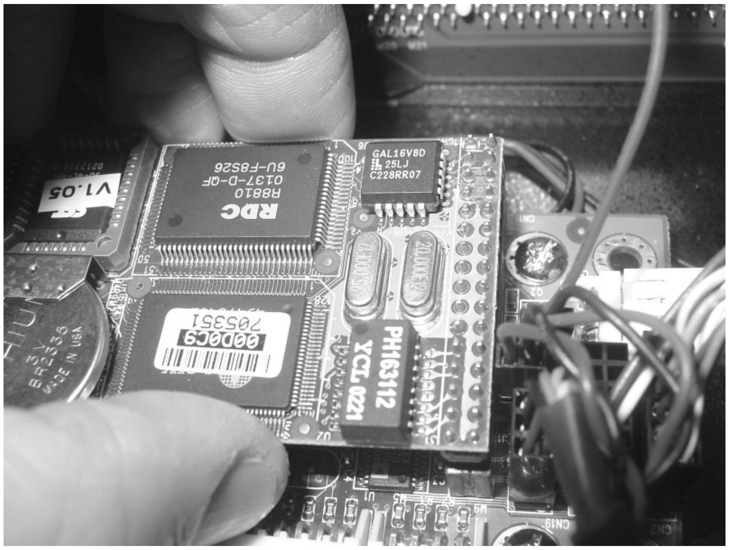
040A

4. Disconnect the CD data cable connector from the left front edge of the CPU module.



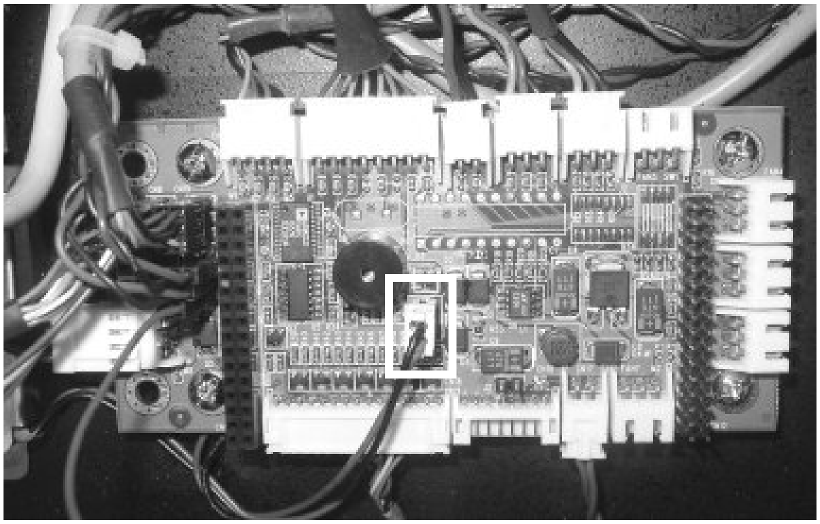
038A

5. Unplug the SNMP extension board from the SNMP connection board. Gently wiggle the SNMP extension board to help remove it from the connection board.



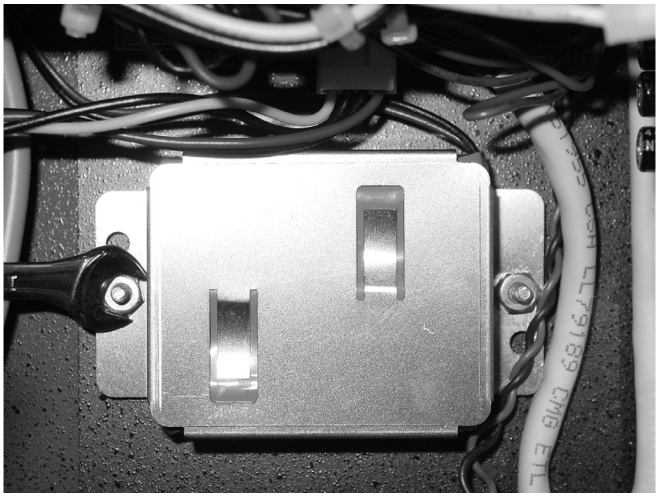
056A

6. Disconnect the SNMP battery connection from the receptacle on the top of the SNMP connector board. Note the position and orientation of the connector for reassembly.



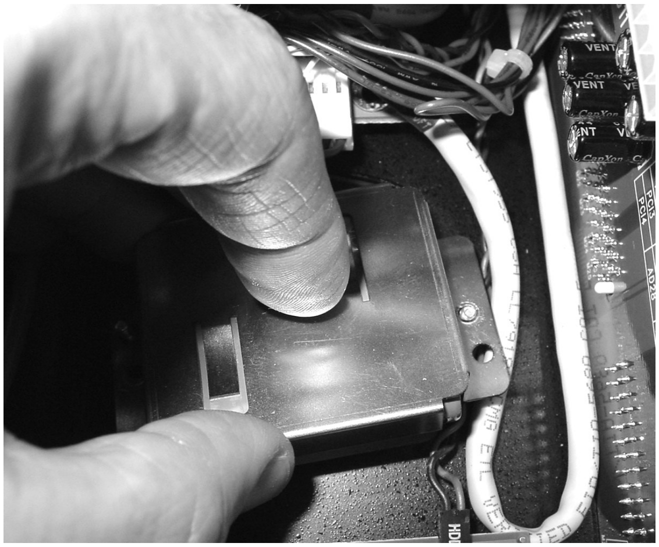
022A

7. Using an open-end wrench, remove the 2 nuts securing the SNMP battery bracket to the chassis.



186A

8. Remove battery/bracket from the screws.



185A

9. Reverse the steps in this procedure to install the SNMP battery.

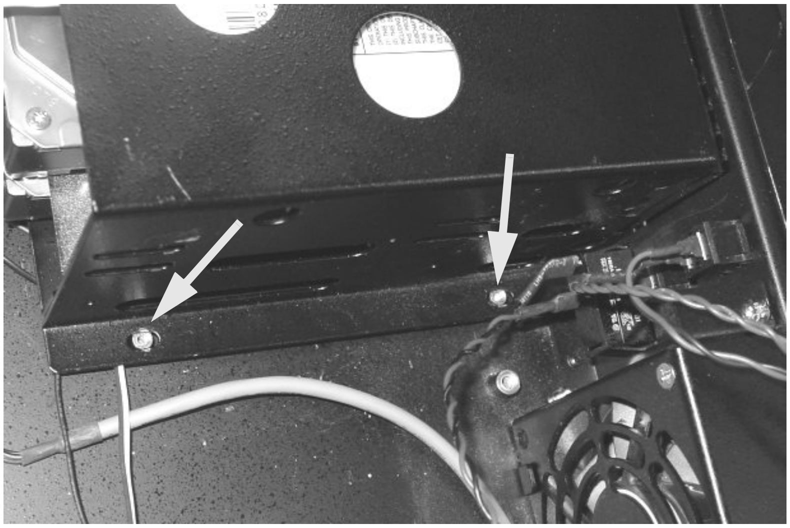
CAUTION

EQUIPMENT DAMAGE — Use extra care to make sure the pins are properly aligned before seating the SNMP extension board. Bent/broken pins may result if the pins are misaligned.

10. If applicable, perform the "Electrical Safety Tests" on page 4-10.

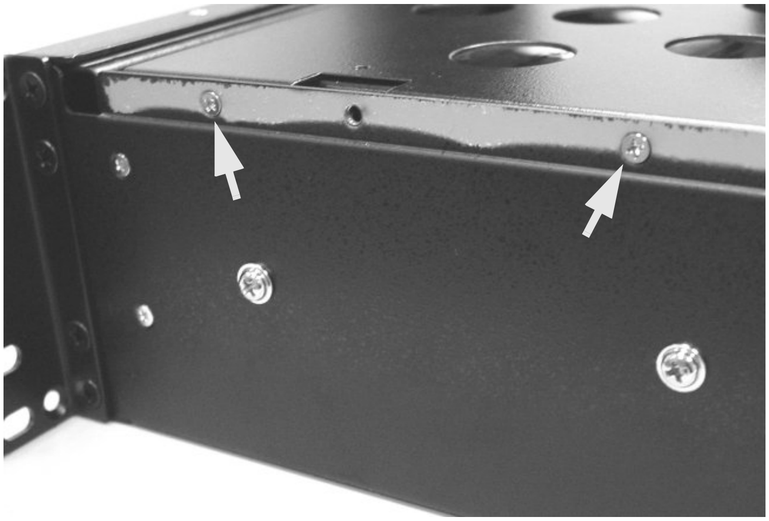
Drive Bay

1. Complete “Field Replacement Preparation” on page 6-5.
2. Remove the chassis cover according to “Chassis Cover” on page 6-10.
3. Using a phillips screwdriver, remove the 2 screws securing the inside edge of the drive bay to the bottom of the chassis.



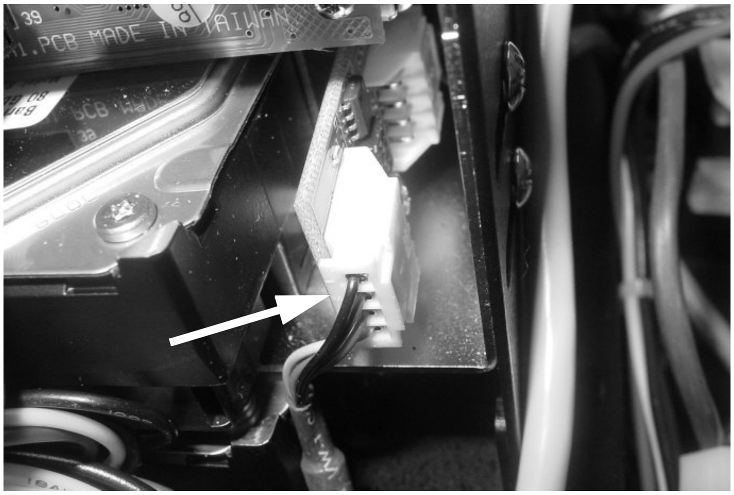
016A

4. Using a phillips screwdriver, remove the 2 screws securing the outside edge of the drive bay to the right side of the chassis.

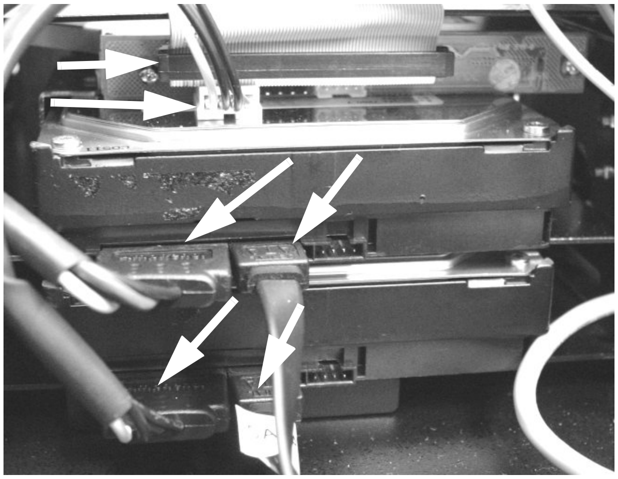


017A

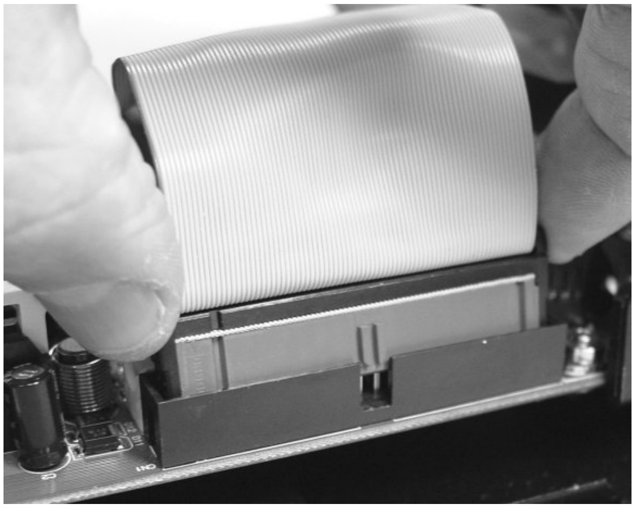
5. Disconnect the connector from the back of the temperature sensor located along the left edge of the CD/top hard drive carrier.



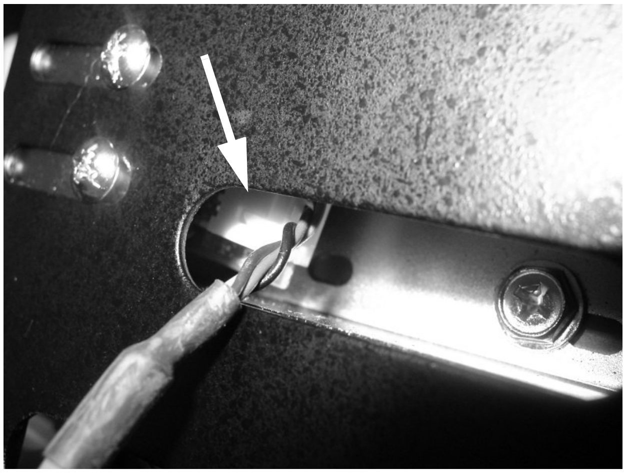
6. Disconnect all power and data cables from the backs of the CD ROM and hard drives. Note the position and orientation of the connectors for reassembly.



7. If you are replacing the CD drive, disconnect the CD data cable connector from the CPU module and discard the cable. The CD FRU kit contains a replacement data cable.



8. Remove the drive bay from the chassis far enough to have free access to the left side of the drive bay. Disconnect the connector from the front of the temperature sensor through the top slot in the left side of the drive bay.



9. To continue with either hard drive, CD ROM drive, or temperature sensor removal, proceed to:
    - "Bottom Hard Drive" on page 6-30
    - "Top Hard Drive" on page 6-31
    - "CD ROM Drive" on page 6-34
    - "Temperature Sensor" on page 6-52
10. Reverse the steps in this procedure to install the drive bay.
11. If applicable, perform the "Electrical Safety Tests" on page 4-10.

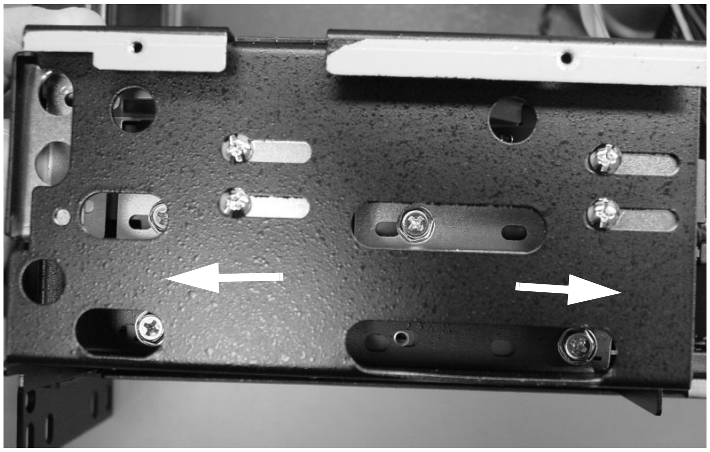
Hard Drive

The top and bottom hard drives have different procedures. Refer to:

- "Bottom Hard Drive" on page 6-30
- "Top Hard Drive" on page 6-31

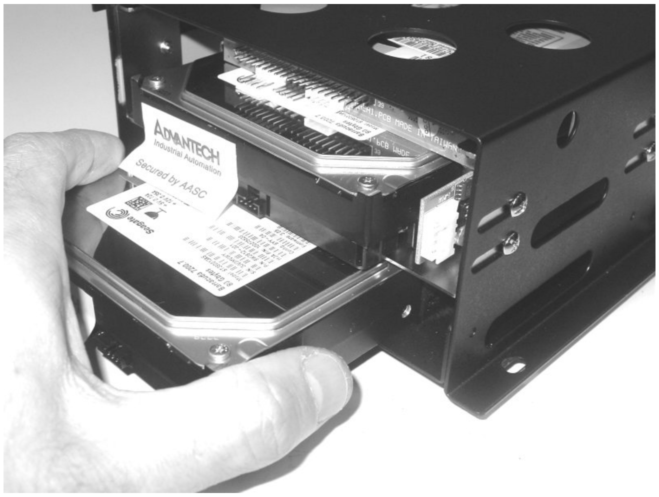
Bottom Hard Drive

1. Complete "Field Replacement Preparation" on page 6-5.
2. Remove the chassis cover according to "Chassis Cover" on page 6-10.
3. Remove the drive bay according to "Drive Bay" on page 6-27.
4. Using a phillips screwdriver, remove the 4 anchor screws securing the bottom hard drive on both sides inside the drive bay.



018A

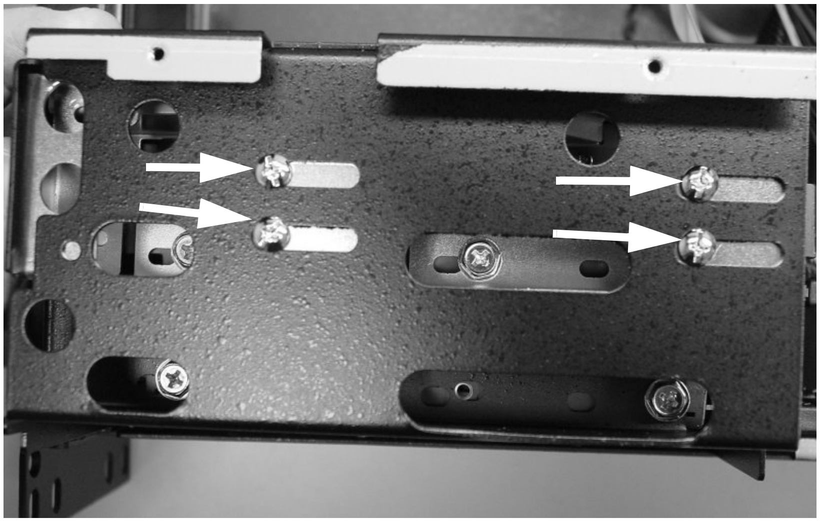
5. Slide the bottom hard drive out of the back of the drive bay.



074A

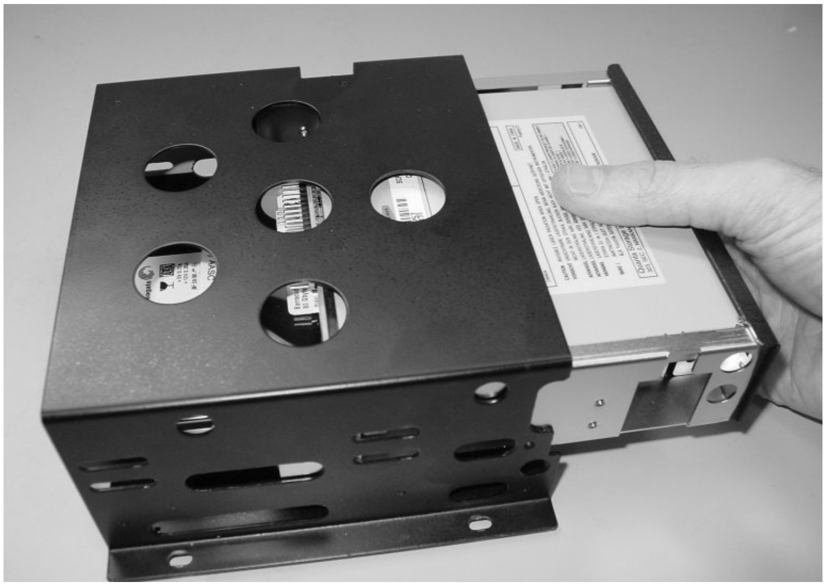
Top Hard Drive

1. Complete “Field Replacement Preparation” on page 6-5.
2. Remove the chassis cover according to “Chassis Cover” on page 6-10.
3. Remove the drive bay according to “Drive Bay” on page 6-27.
4. Using a phillips screwdriver, remove the 4 anchor screws securing the CD/hard drive carrier in the drive bay on both sides.



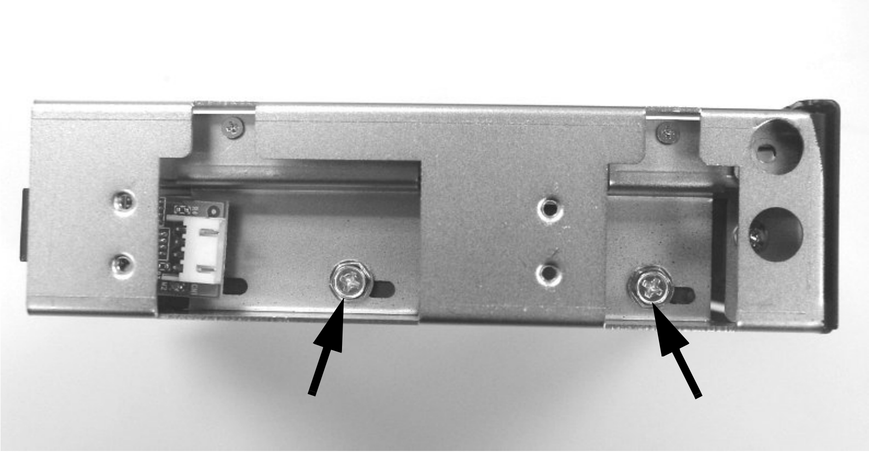
018A

5. Slide the CD/hard drive carrier out of the front of the drive bay.

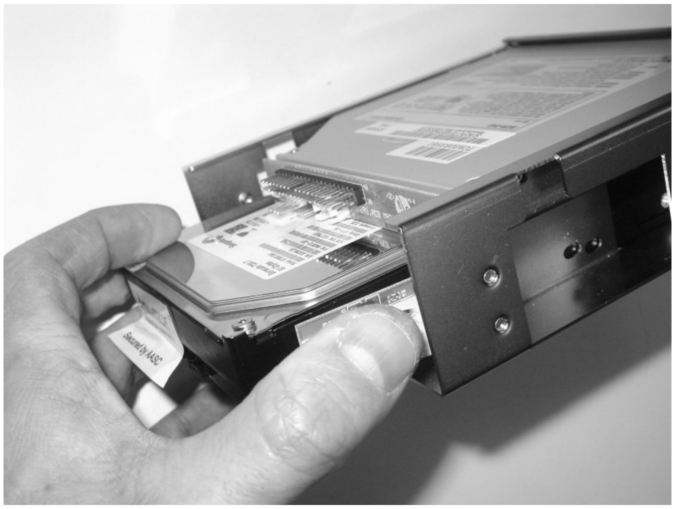


160A

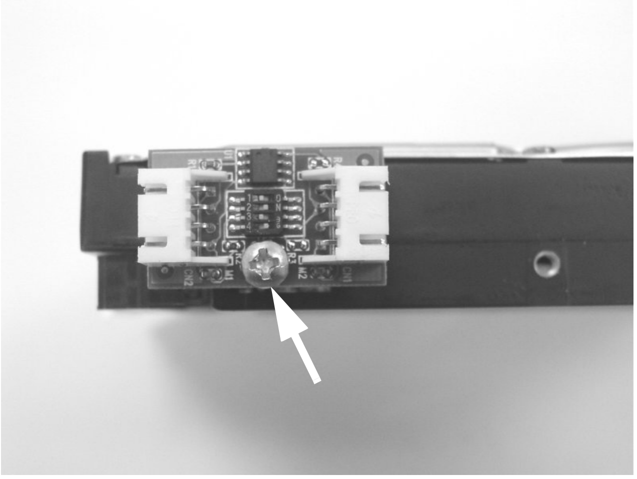
6. Using a phillips screwdriver, remove the 4 screws securing the top hard drive in the CD/hard drive carrier on both sides.



7. Slide the top hard drive out of the back of the CD/hard drive carrier.



8. Using a phillips screwdriver, remove the screw securing the temperature sensor to the back left of the hard drive.



9. Reverse the steps in this procedure to install the top hard drive.

NOTE

> Plan to have alternative monitoring for patients admitted to the tower that is being repaired by either moving them to another ATS using the BedDuplicator application that can be run from the PTS version directory or by asking the hospital staff for bedside monitoring of the telemetry patients until the mirroring procedure is complete.

10. Connect the FE laptop to the ATS.
11. Log into ATS through VNC.
12. After completeing all the steps to replace the defective hard drive, power on the ATS.
13. The PromiseFastTrack TX2+ application starts to replicate the good hard drive to the replaced hard drive.
14. On the ATS desktop, click the *Promise Array Management (PAM)* icon.
15. Right-click on the drive icon and log in as **administrator** and leave the password field blank.
16. Navigate to the correct array.

NOTE

> There is a *Mirroring Process* progress bar.

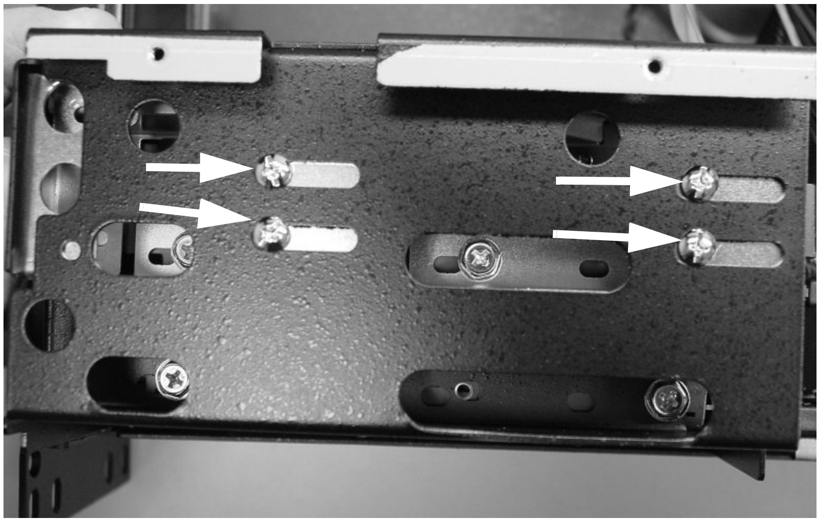
17. After the mirroring process is complete, the 100% complete information will be displayed.

NOTE

> The mirroring procedure will take approximately 45 minutes.

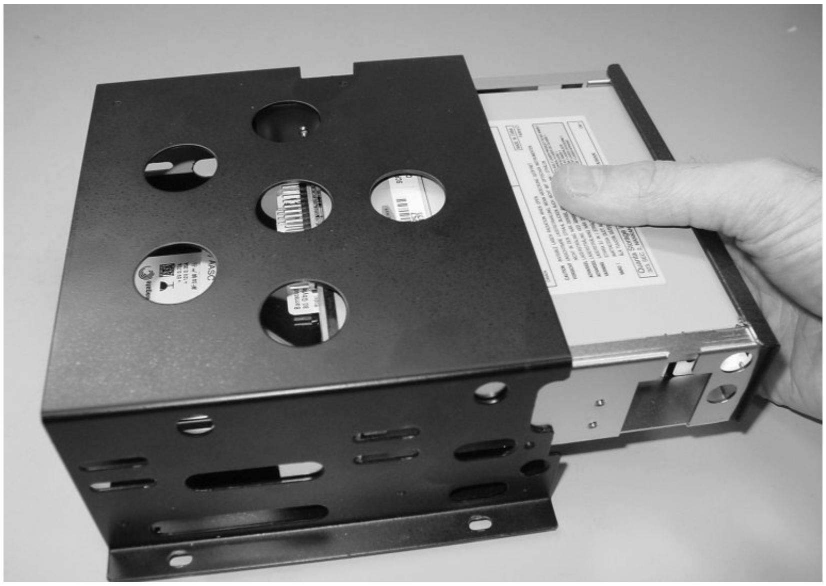
CD ROM Drive

1. Complete “Field Replacement Preparation” on page 6-5.
2. Remove the chassis cover according to “Chassis Cover” on page 6-10.
3. Remove the drive bay according to “Drive Bay” on page 6-27.
4. Using a phillips screwdriver, remove the 4 anchor screws securing the CD/hard drive carrier in the drive bay on both sides.



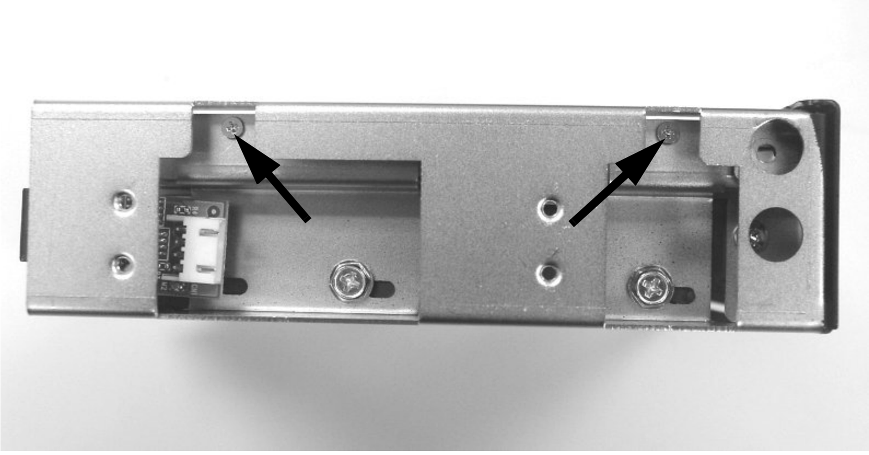
018A

5. Slide the CD/hard drive carrier out of the front of the drive bay.



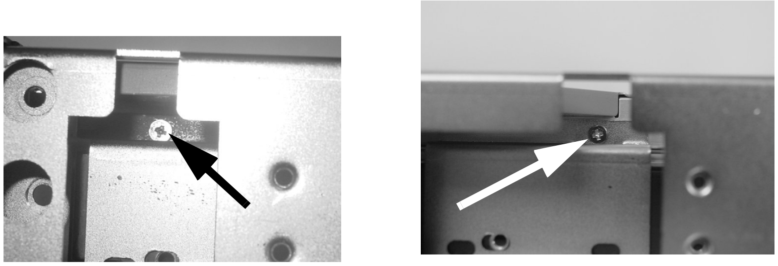
160A

6. Using a phillips screwdriver, remove the 2 screws securing the left side of the CD ROM drive into the CD/hard drive carrier.



063A

7. Using a phillips screwdriver, remove the 2 screws securing the right side of the CD ROM drive into the CD/hard drive carrier.



066A, 066A

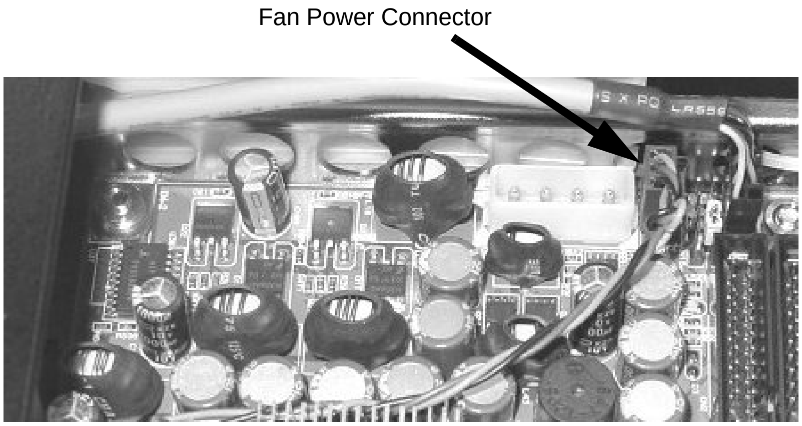
8. Lift the CD ROM drive off of the CD/hard drive carrier.

071A

9. Reverse the steps in this procedure to install the CD ROM drive.

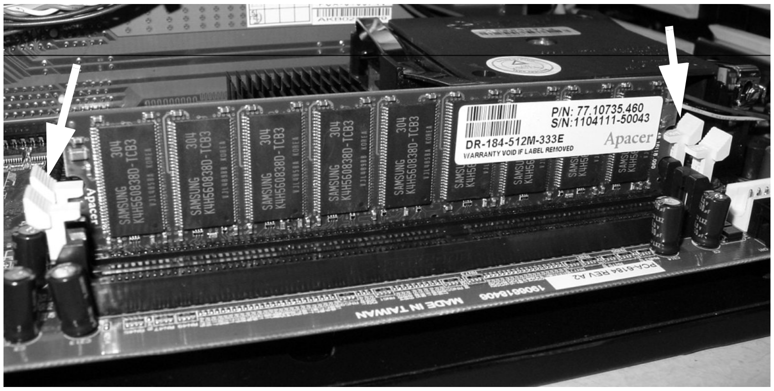
CPU Fan

1. Complete “Field Replacement Preparation” on page 6-5.
2. Remove the chassis cover according to “Chassis Cover” on page 6-10.
3. Disconnect the CPU fan power connector from the left front corner of the CPU main board. Note the position and orientation of the connector for reassembly.


Fan Power Connector

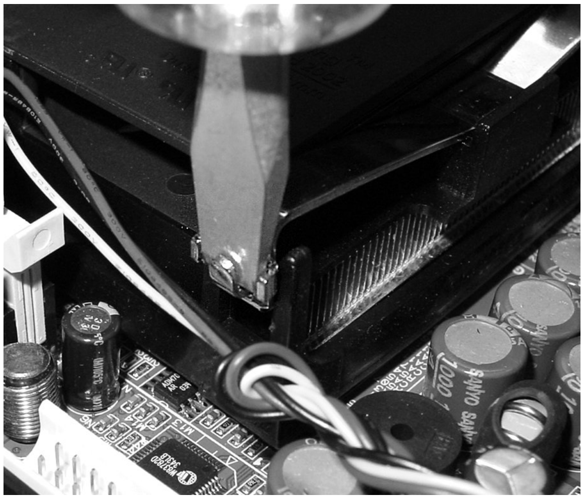
019A

4. Rotate the latches securing the memory card out and down. Remove the memory card from the slot in the CPU main board.


P/N: 77.10735.460
S/N:1104111-50043
DR-184-512M-333E
Apacer

204A

5. Insert a flat-bladed screwdriver into a spring clip securing the fan to the CPU main board as shown in the figure. Push down on the spring clip, and lever with the screwdriver to unhook the clip. Remove the clip. Repeat for the other spring clip. Remove the CPU fan.



205A

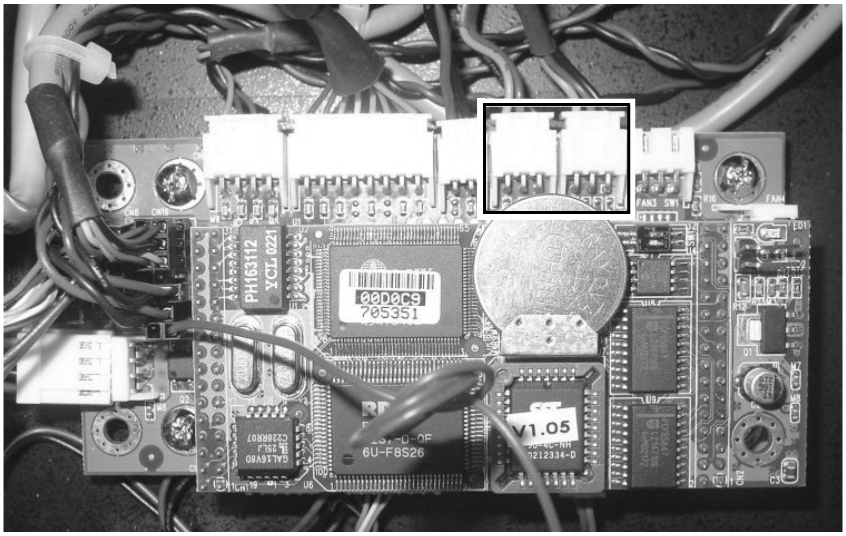
NOTE

> Considerable force is needed to unhook the spring clips. To prevent slipping, and possible damage to the CPU board, it is important to use a flat-bladed screwdriver with a blade size which fits snugly into the spring clip. The figure shows the proper fit.

6. Reverse the steps in this procedure to install the CPU fan.
7. If applicable, perform the “Electrical Safety Tests” on page 4-10.

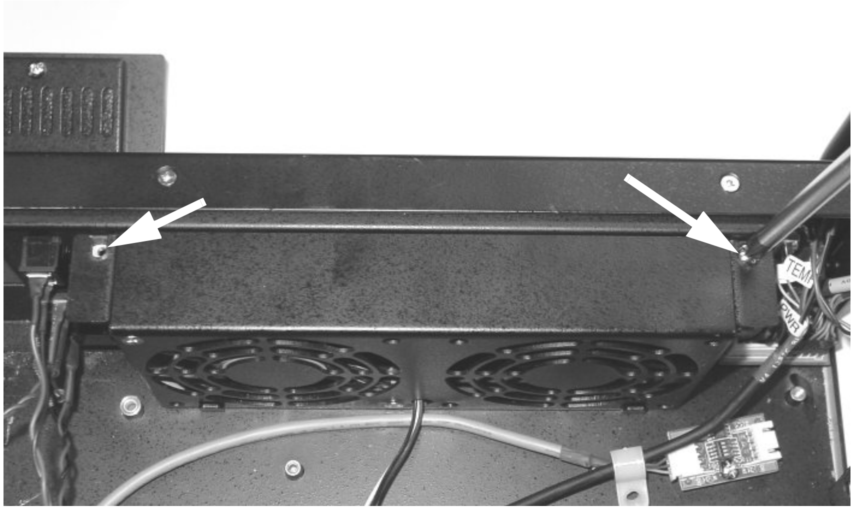
Chassis Fan

1. Complete “Field Replacement Preparation” on page 6-5.
2. Remove the chassis cover according to “Chassis Cover” on page 6-10.
3. Disconnect the cabinet fan power connectors from the receptacles along the left edge of the SNMP connector board. Note the position and orientation of the connectors for reassembly.



022A

4. Using a phillips screwdriver, remove the 2 screws securing the cabinet fan assembly at the front of the chassis. Remove the fan assembly.

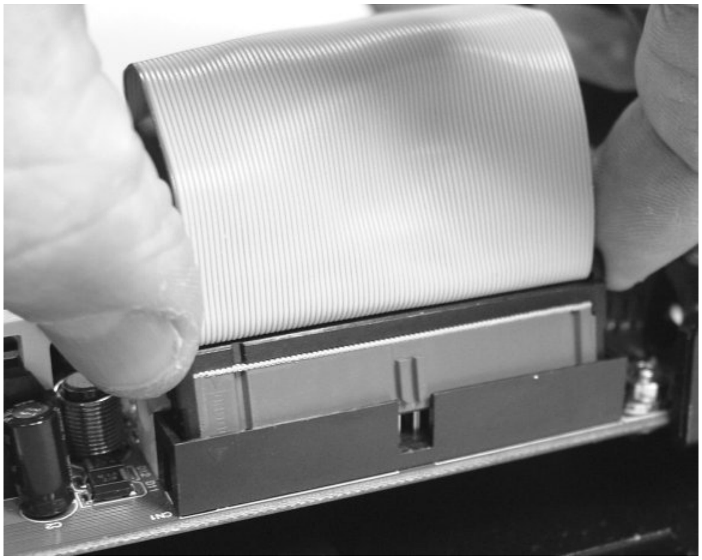


101A

5. Remove the fan from the fan assembly.
6. Reverse the steps in this procedure to install the CPU fan.
7. If applicable, perform the “Electrical Safety Tests” on page 4-10.

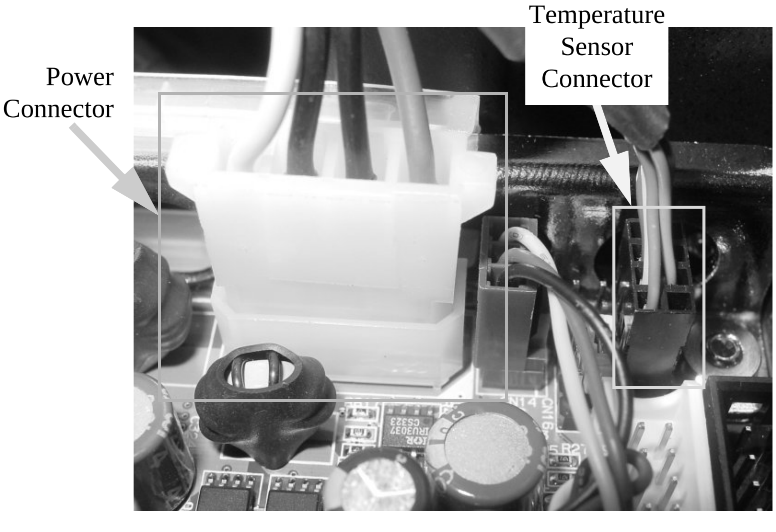
CPU Boards

1. Complete "Field Replacement Preparation" on page 6-5.
2. Disconnect all jacks and plugs from the CPU board I/O ports at the back of the ApexPro Telemetry Server.
3. Remove the chassis cover according to "Chassis Cover" on page 6-10.
4. Disconnect the CD data cable connector from the main CPU board.



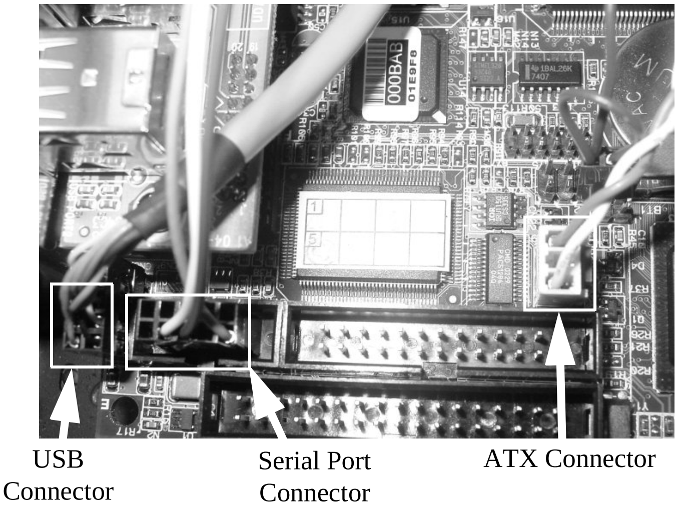
038A

5. Disconnect the power, and temperature sensor connectors from the receptacles near the front left corner of the main CPU board. Note the position and orientation of the connectors for reassembly.



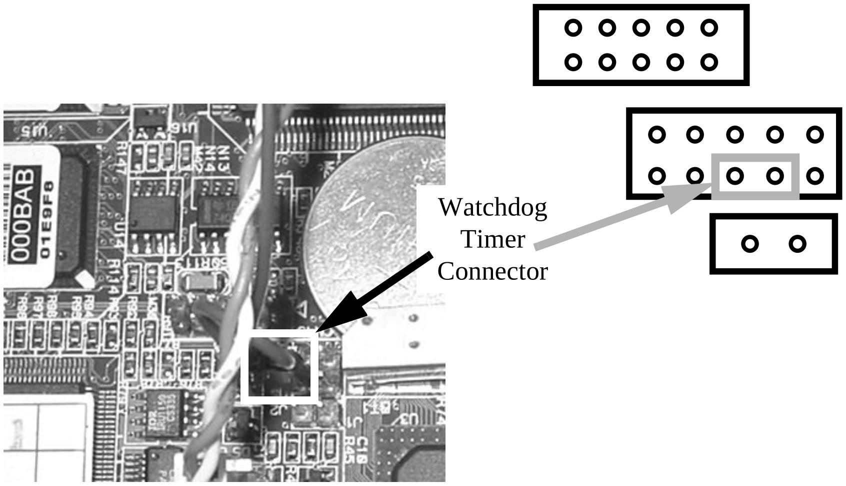
097A

6. Disconnect the ATX, serial port and USB connectors from the receptacles near the back left corner of the main CPU board. Note the position and orientation of the connectors for reassembly.


USB Connector
Serial Port Connector
ATX Connector

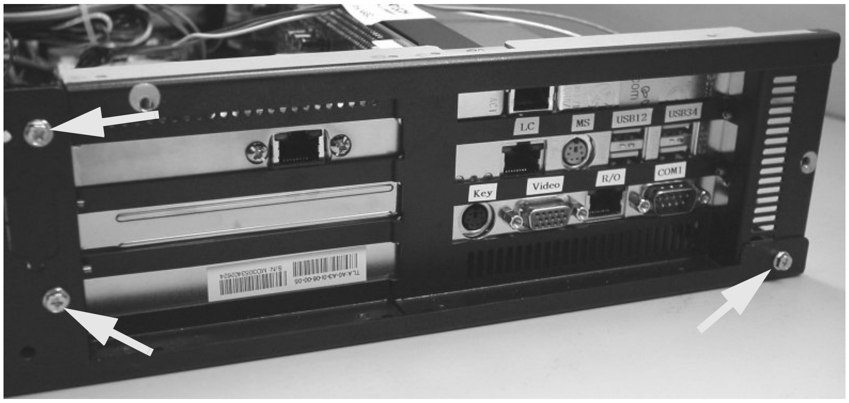
098A

7. Disconnect the watchdog timer from the receptacle near the back left corner of the main CPU board. Note the pin position and orientation of the watchdog timer connector for reassembly.


Watchdog Timer Connector

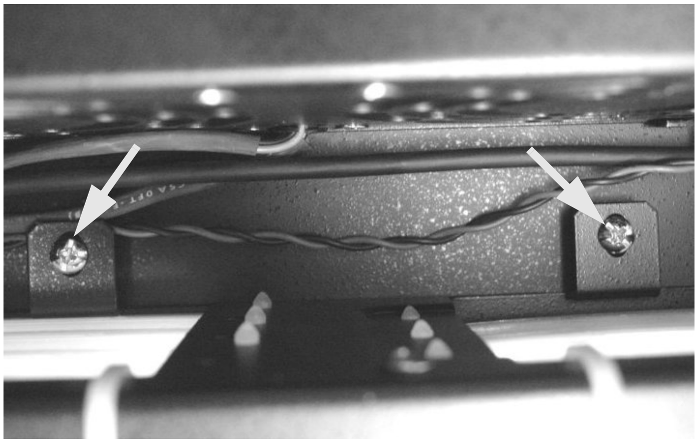
099A, 100A

8. Remove the 3 screws securing the back of the CPU module to the chassis.



046A

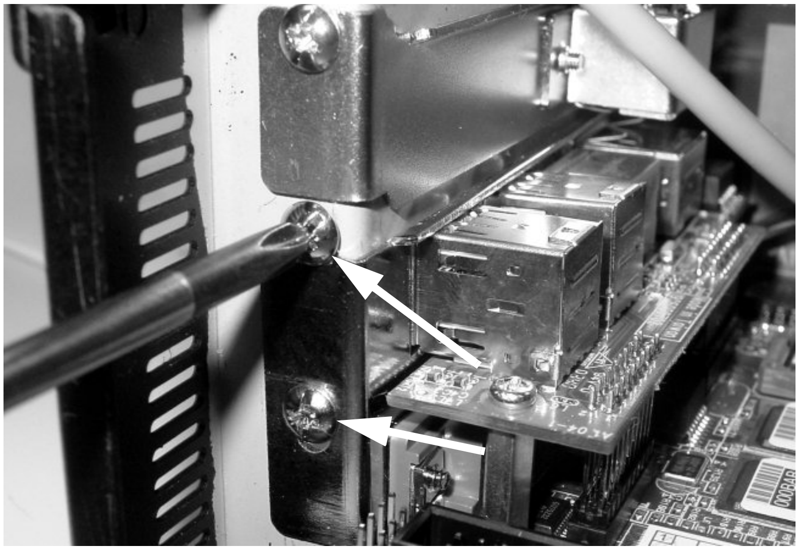
9. Remove the 2 screws securing the front of the CPU module to the chassis.



048A

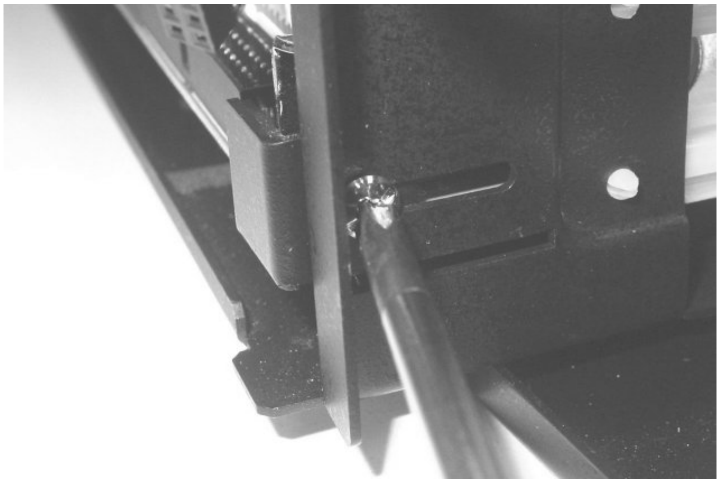
10. Carefully move the CPU module far enough to allow card removal.

11. Using a phillips screwdriver, remove the 2 screws securing the USB/mouse/ Unity Network MC network ports and the back of the main CPU board in the CPU module.



091A

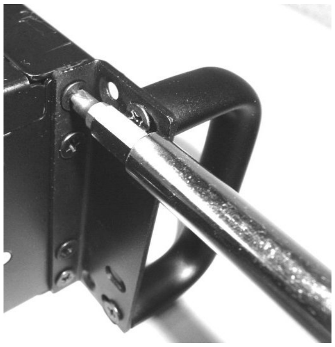
12. Using a phillips screwdriver, remove the screw securing the angle bracket retaining the left front corner of the main CPU board. Remove the angle bracket.



096A

NOTE

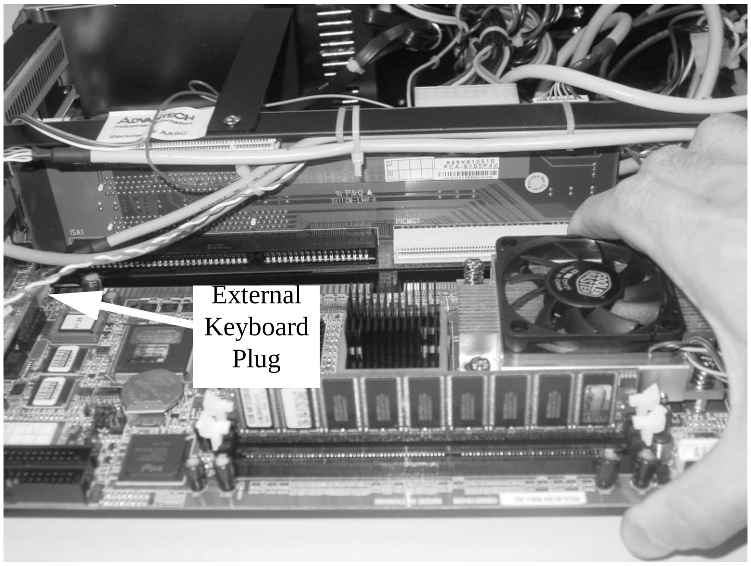
It may be necessary to remove the left front handle to access the screw securing the angle bracket.



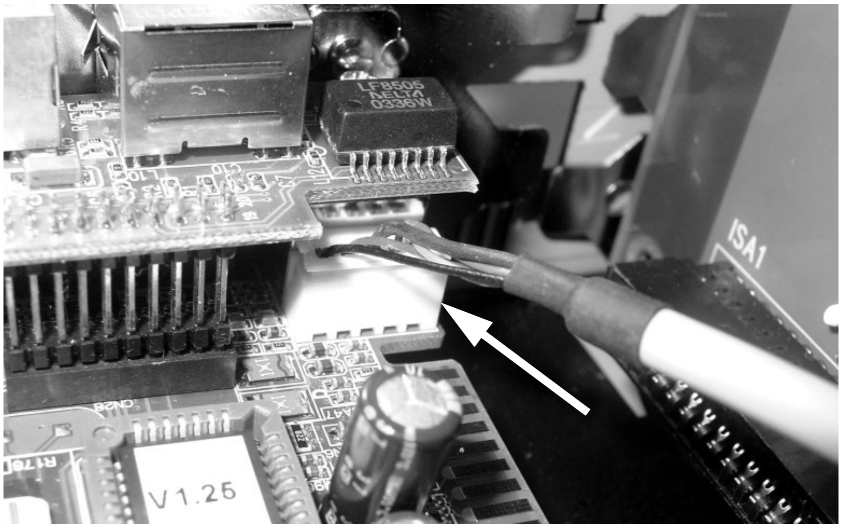
13. Pull the main CPU board out of the slots far enough to allow access to the external keyboard plug in the back right corner of the main CPU board.

CAUTION

Do not pull the main CPU board out any further than necessary to allow access to the external keyboard plug in the back right corner of the main CPU board, or damage to the external keyboard plug/ wires may result.



14. Disconnect the external keyboard plug from the receptacle in the back right corner of the main CPU board. Note the position and orientation of the connector for reassembly.

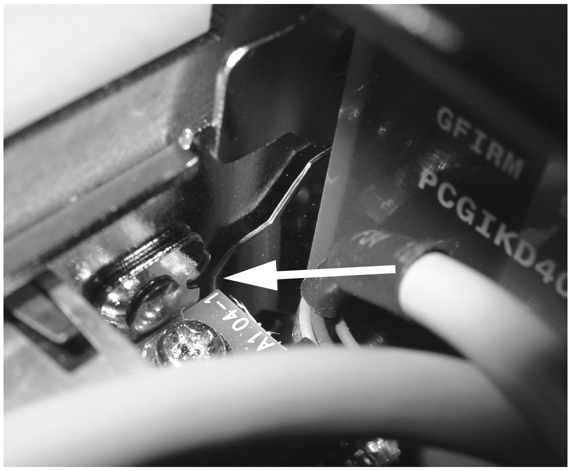


093A

15. Remove the main CPU board from the chassis.

NOTE

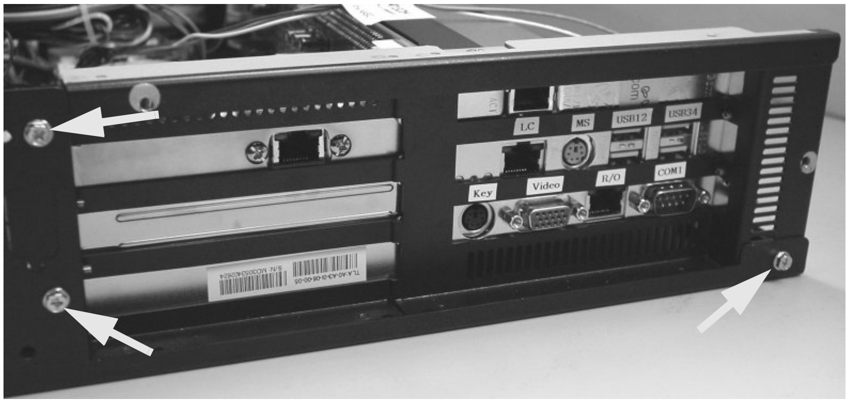
During re-assembly, when inserting the connection tabs into the slots, insert the end of the middle slot cover in the back panel into the notch at the back right corner of the main CPU main board as shown in the figure. The slot cover must fit into the notch in the CPU main board, or the connection tabs on the main CPU board will not fully seat into the slots.



216A

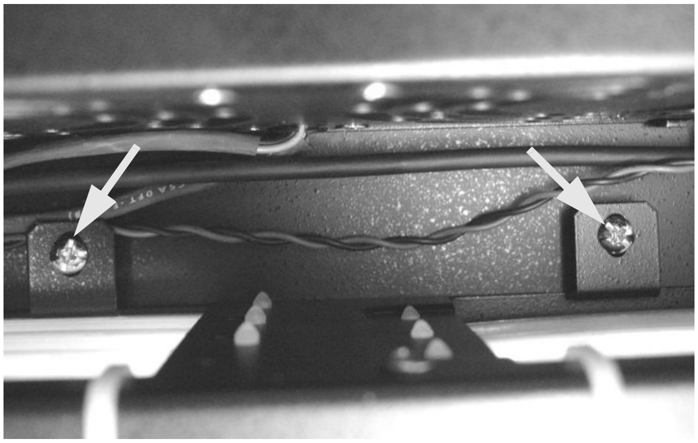
16. Remove the CPU fan according to “CPU Fan” on page 6-36.

17. Remove the 3 screws securing the back of the CPU module to the chassis.



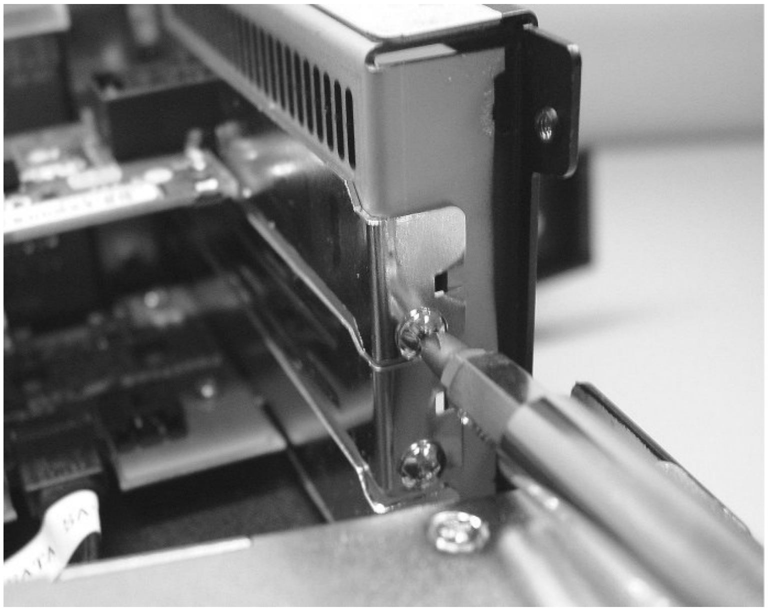
LC
MS
USB12
USB34
Key
Video
R/O
COM1
046A

18. Remove the 2 screws securing the front of the CPU module to the chassis.



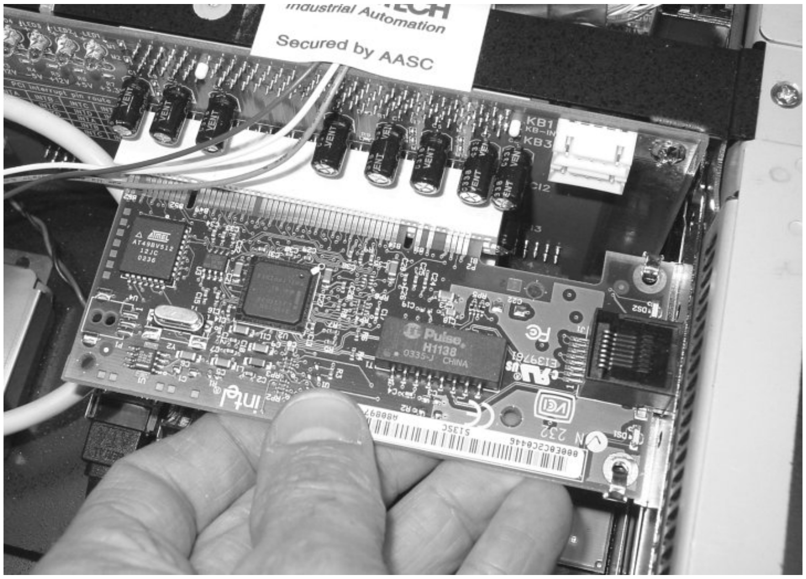
19. Carefully move the CPU module far enough to allow card removal.

20. Using a phillips screwdriver, remove the screw securing the network card in the slot.



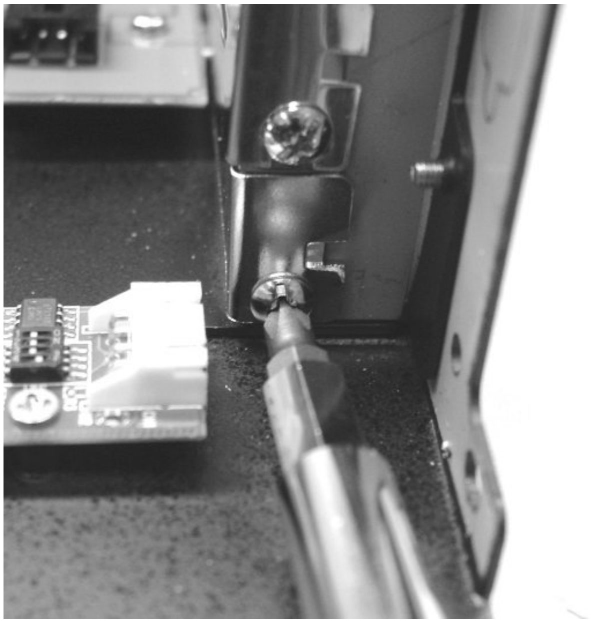
163A

21. Remove the network card from the slot.

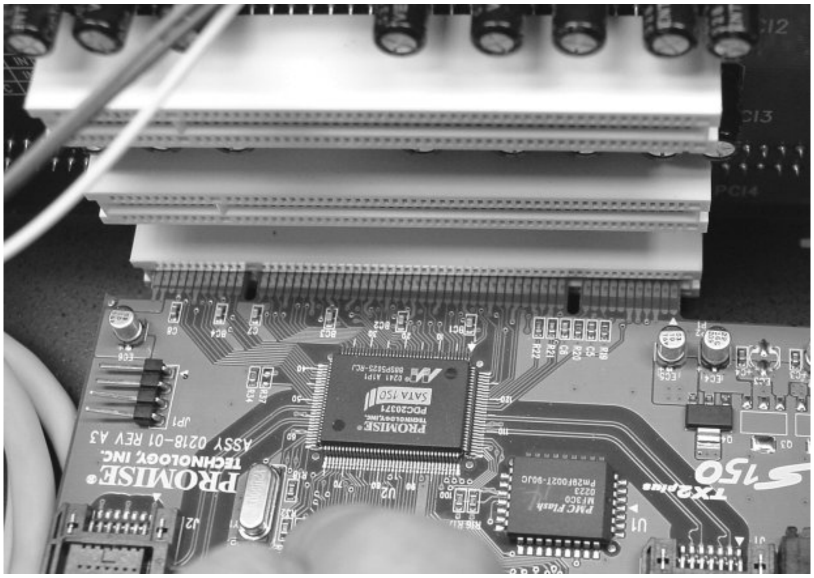


164A

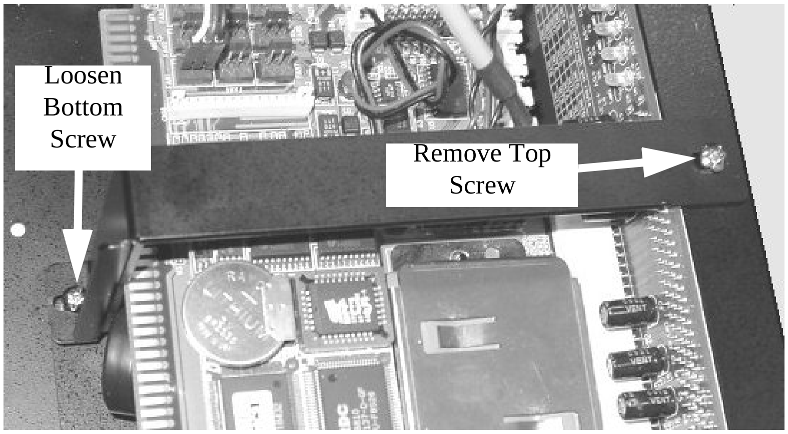
22. Using a phillips screwdriver, remove the screw securing the RAID card in the slot.



23. Remove the RAID card from the slot.

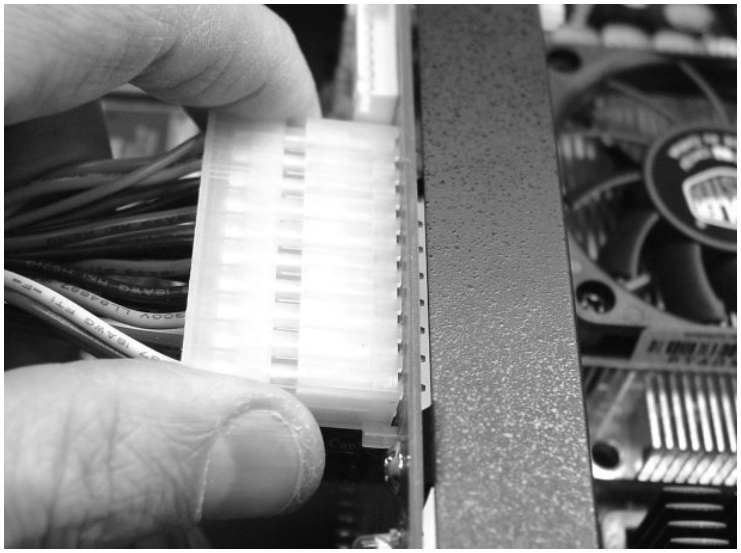


24. Using a phillips screwdriver, remove the top screw securing the “L” bracket to the top of the CPU module. Loosen the bottom screw securing the bracket and pivot the bracket 90°.



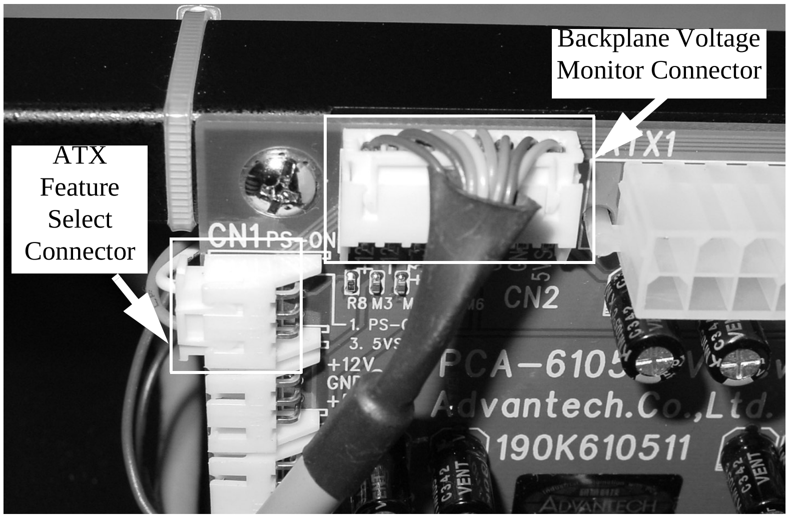
020A

25. Disconnect the power cable connector from the CPU module.



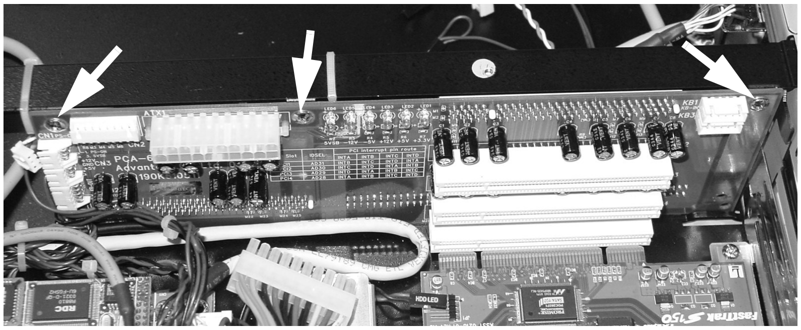
040A

26. Disconnect the ATX feature select and backplane voltage monitor connectors from the top front corner of the CPU riser board. Note the position and orientation of the connectors for reassembly.


Backplane Voltage Monitor Connector
ATX Feature Select Connector

213A

27. Using a phillips screwdriver, remove (for installation) the three screws securing the CPU riser board to the chassis.



212A

28. Lift the CPU riser board up and out of the chassis.
29. Reverse the steps in this procedure to install the CPU boards.
30. If applicable, perform the "Electrical Safety Tests" on page 4-10.

Power Module

WARNINGS

SHOCK HAZARD — NEVER open the power supply. There are no field serviceable components inside. Capacitors inside the power supply case present a shock hazard even with the power switched off and the power cord removed.

LOSS OF MONITORING/FUNCTION — It is important to identify the defective power supply before turning off and removing it. If you turn off/remove the wrong power supply, the ApexPro Telemetry Server will shut down and the ApexPro system will stop functioning.

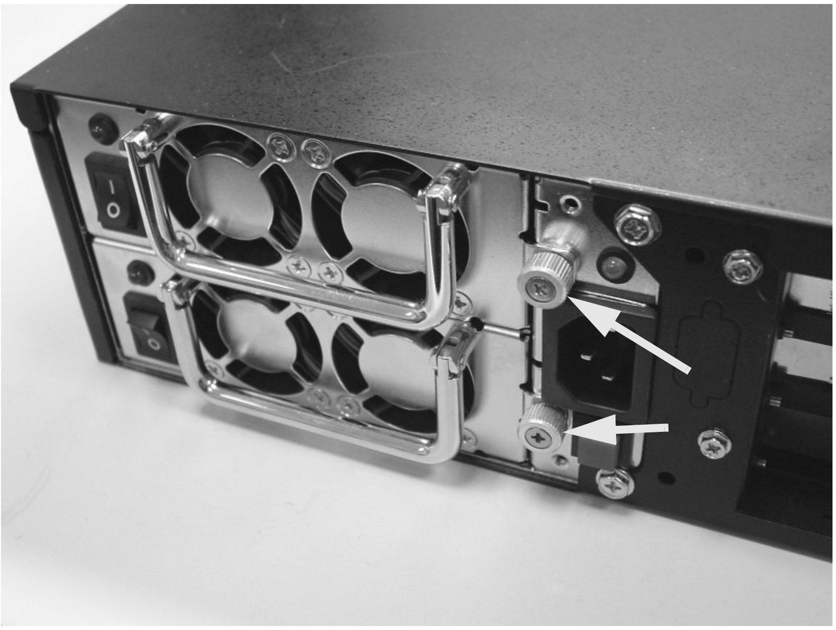
CAUTION

BURN HAZARD — Do not touch the power modules with your bare hands. The power module covers act as heat sinks to aid cooling, and are typically at 50°C to 60°C (122°F to 140°F) when the ApexPro Telemetry Server is in operation. Severe burns could result.

The ApexPro Telemetry Server is equipped with "Hot swappable" power modules. This feature allows for power module replacement with no interruption in ApexPro Telemetry Server operation.

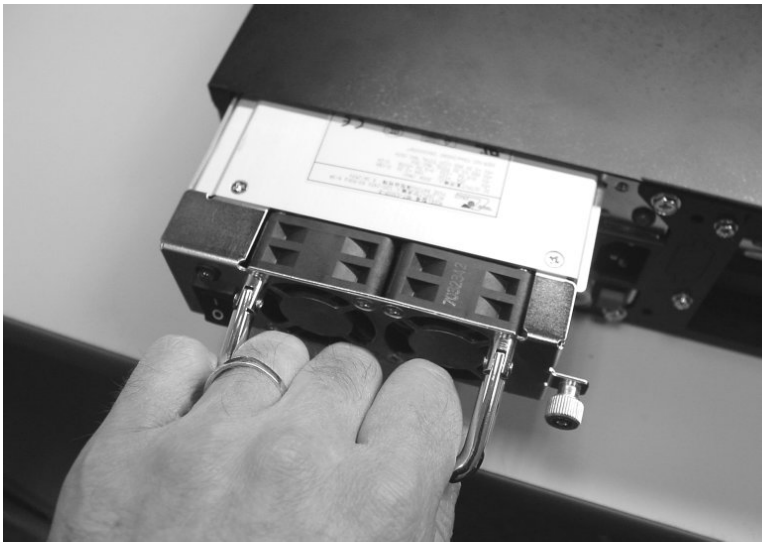
1. If you are removing a defective power module, determine which power module is defective. The LED over the power switch on the defective module will not be illuminated.
2. Put on heat-resistant gloves, and keep them on for the remainder of this procedure.
3. Turn off the power switch on the left side of the power module back panel.

4. Loosen the thumbscrew securing the power supply in the chassis.



166A

5. Grasp the handle on the back of the power module. Pull the power supply out of the ApexPro Telemetry Server.

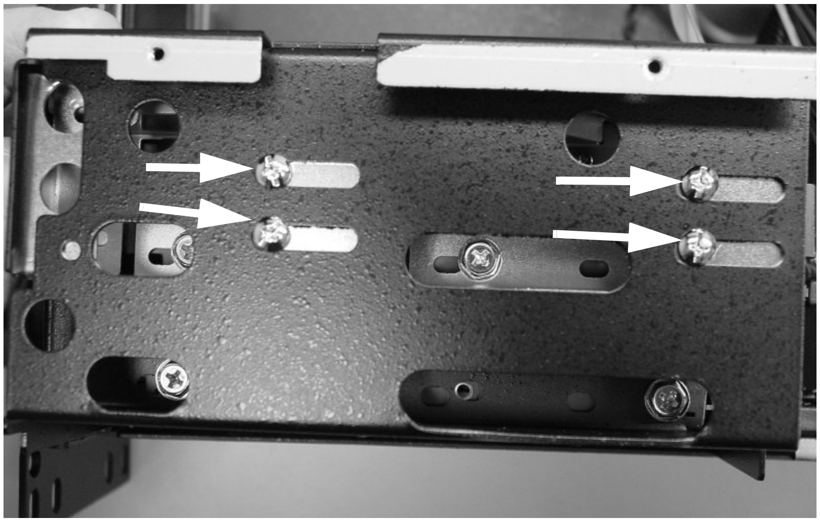


165A

6. Place the power module in a safe place and allow it to cool. Ensure that no one touches it with bare hands it until it has cooled to a safe temperature.
7. Reverse the steps in this procedure to install the power modules.
8. If applicable, perform the “Electrical Safety Tests” on page 4-10.

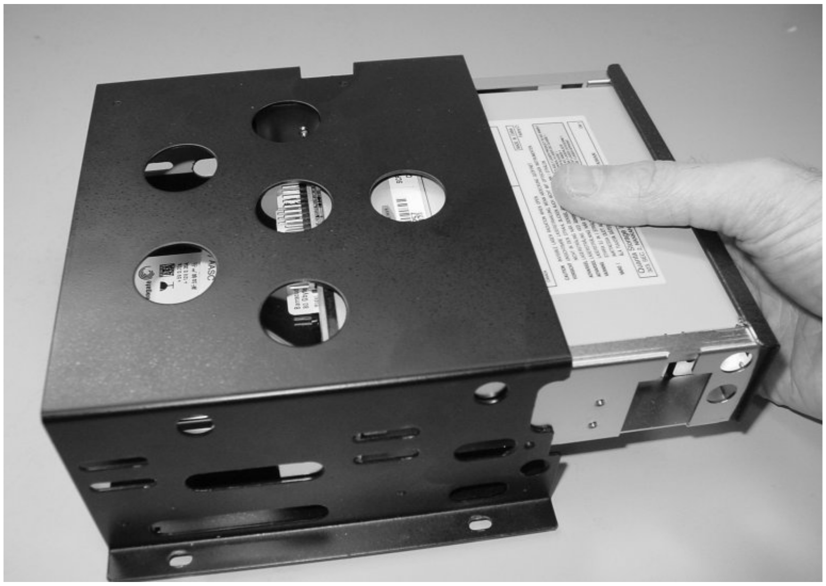
Temperature Sensor

1. Remove the drive bay according to “Drive Bay” on page 6-27.
2. Using a phillips screwdriver, remove the 4 anchor screws securing the CD/hard drive carrier in the drive bay on both sides.



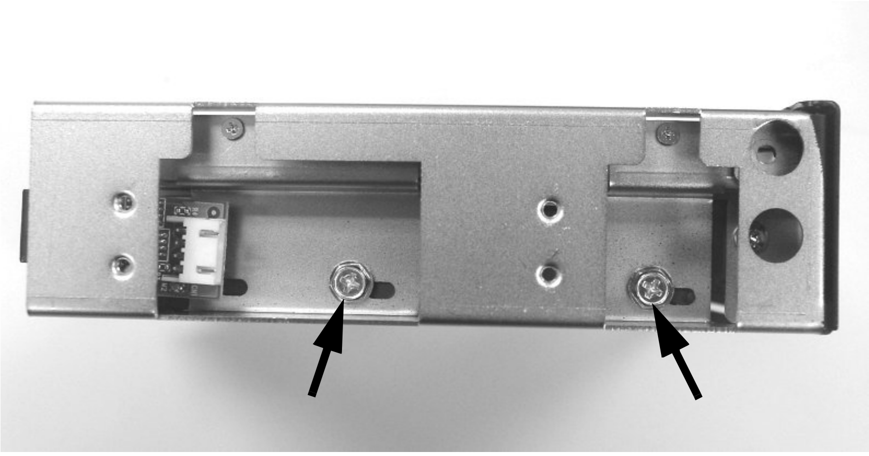
018A

3. Slide the CD/hard drive carrier out of the front of the drive bay.



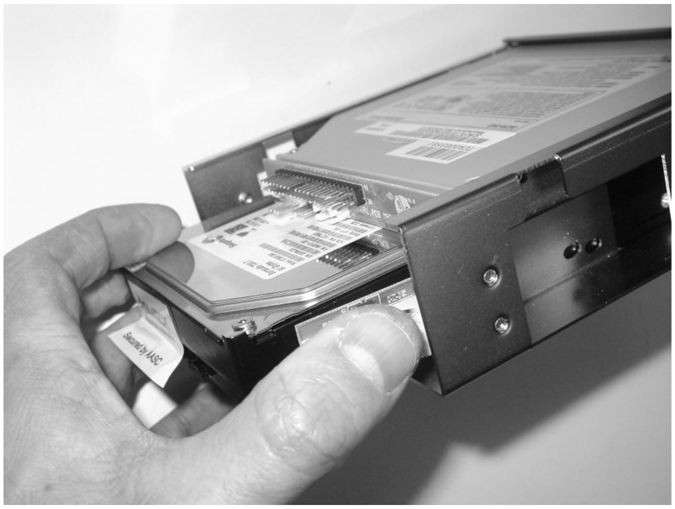
160A

4. Using a phillips screwdriver, remove (for installation) the four screws securing the top hard drive in the CD/hard drive carrier on both sides.



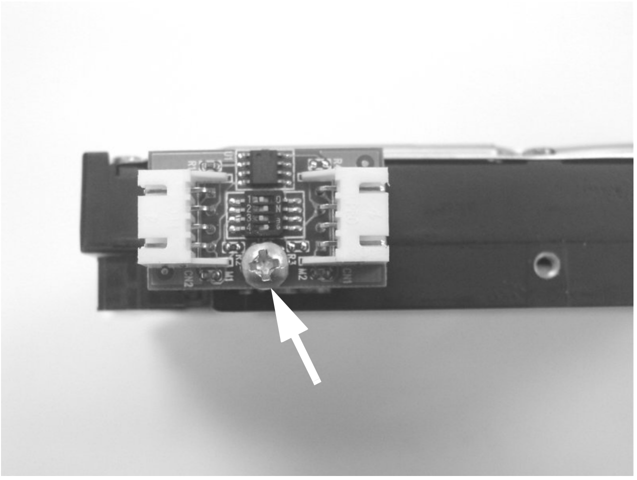
063A

5. Slide the top hard drive out of the back of the CD/hard drive carrier.



069A

6. Using a phillips screwdriver, remove the screw securing the temperature sensor to the back left of the hard drive.



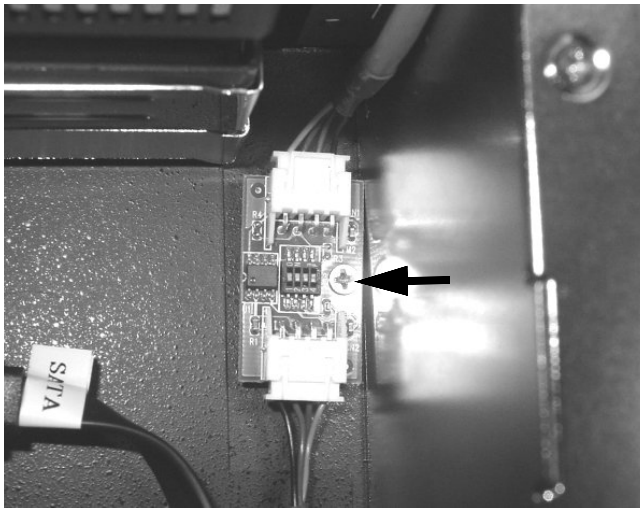
070A

NOTE

Note the position of the temperature sensor DIP switches for re-assembly.

Number	Position
1	OFF
2	ON
3	OFF
4	ON

7. Using a phillips screwdriver, remove the screw securing the temperature sensor at the back of the chassis floor, next to the power supply module.



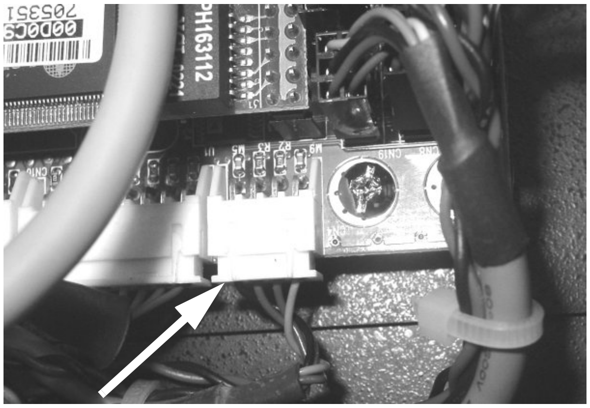
075A

NOTE

Note the position of the temperature sensor DIP switches for re-assembly.

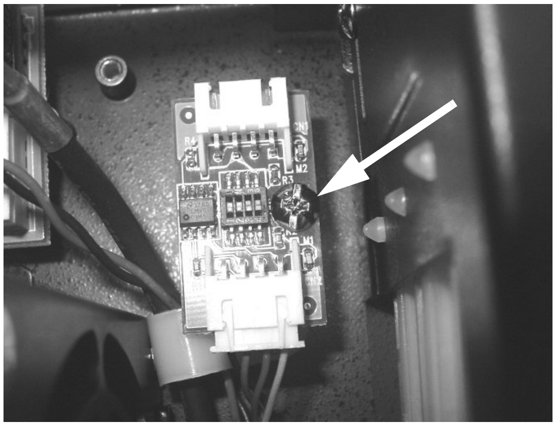
Number	Position
1	OFF
2	OFF
3	OFF
4	ON

8. Disconnect the temperature sensor wiring harness plug from the receptacle at the back right edge of the SNMP.



076A

9. Using a phillips screwdriver, remove the screw securing the temperature sensor at the front left corner of the chassis floor, behind the left edge of the chassis fan.



077A

NOTE

Note the position of the temperature sensor DIP switches for re-assembly.

Number	Position
1	OFF
2	OFF
3	ON
4	ON

10. Remove the temperature sensors and the associated temperature sensor wire harnesses, cutting/removing any ties as required.

11. Reverse the steps in this procedure to install the temperature sensors.

12. If applicable, perform the “Electrical Safety Tests” on page 4-10.

For your notes

A Technical Specifications

For your notes

Technical Specifications

Due to continual product innovation, GE Medical Systems *Information Technologies* designs and specifications are subject to change without notice.

OEM Compliance Specifications

Listed/labeled by the OEM Mfg. as compliant with:

Safety

Certificate	Item Number	Country
UL (listed ITE)	E149282	US
CSA	LR50978	Canada
CE mark	EN60950	European Union
TUV_{GS} mark		Germany
Demko		Denmark
Fimko		Finland
Nemko		Norway
Semko		Sweden
CNLA	R33001	Taiwan

EMC

Certificate	Item Number	Country
FCC: Class B		US
ICES-003: Class B		Canada
CE mark	CISPR 22 (EN55022) EN61000-3-2 EN61000-3-3 CISPR 24 (EN55024)	European Union
C-Tick mark	N119	Australia
VCCI mark		Japan

NOTE

All OEM’s maintain their respective Technical Dossiers and compliance certifications.

Performance Specifications

Processor Speed	2.4 Gigahertz
Number of Patients Supported	16
Max. Number of ApexPro Telemetry Servers (in a single care unit)	16

Controls

Power Switch	Power on/off switch or momentary switch. Reset switch behind lockable door.
Keyboard	PS/2
Mouse	PS/2

Processing

Memory	512 ECC RAM
NIC	Intel Pro100 Desktop Adapter M

Indicators (Front Panel LEDs)

Power	Green = OK, Red = Power Failure.
HDD	Orange = Indicates Hard Drive Activity.
Fan	Green = OK, Red = Fan Failure.
Temp	Green = OK, Red = Overheating.

General

Storage	512 MB RAM, CD-ROM drive, 80 GB hard drive.
Software Updates	Via Network, CD-ROM drive.
Serial/COM Outputs	External asynchronous RS-232 serial port.
Video Output	Integrated Video, 1024 x 768 @ 75 Hz.
Audio Output	Integrated Audio.
Additional Ports	4 USB Type A.

Environmental Specifications

Backplane	CPU/ 4-PCI.
Power Supply	PS-300ATX-Z.
Power Requirements	Input Range: 100-240 VAC Full Range. Frequency: 50-60 Hz. Input Current: 4.0 A.
Power Consumption	300-320 watts.
Cooling	42 - 57 CFM Forced air with front accessible filter.
Operating Environment Specifications	0°C (+32°F) to +40°C (+104°F). Maximum Altitude: 3,000 meters (10,000 ft). Relative Humidity: 10% -95% RH non-condensing.
Non-operating Storage Environment Specifications	-40°C (-40°F) to +75°C (+167°F). Relative Humidity: 10% - 95% RH non-condensing.
Vibration (operating)	5 Hz~500Hz, 0.5 grams.
Random Vibration (non-operating)	5 to 20Hz, 0.001 to 0.01 G2 per Hz, 20 to 500Hz, 0.01 G2 per.
Shock (operating)	2.0 G with 11 mSec duration, 1/2 sine wave.
Acoustic Noise	Less than 52 dB sound pressure at 5° to 28°C (41° to 82°F).

Physical Specifications

Height	8.8 cm (3.5 in)
Depth	45 cm (17.7 in)
Depth w/Handles	49.5 cm (19.5 in)
Width	48.2 cm (19 in)
Weight	14.3 kg (31.5 lbs.)

Certification

UL/CSA/CE certification as required per the original equipment manufacturer (OEM).

Safety: CE Compliant, UL/cUL approved

For your notes

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Service Laptop Direct Connection Configuration

For your notes

Service Laptop Direct Connection

Normally, the ApexPro Telemetry Server is remotely configured during installation. However, non-standard networks, or conflicting network device identification/ configuration may prevent remote connection.

To connect to the ApexPro Telemetry Server, IP addressing on the service laptop must match the ApexPro Telemetry Server Unity Network IX network TCP/IP configuration scheme, which is defined by the first numbers used for IP addressing and the subnet mask. ApexPro Telemetry Server units are configured at the factory with unique Unity Network IX network IP address values following a 192.168.x.x scheme, with a network mask value of 255.255.255.0.

NOTE

Direct connection of the service laptop to the ApexPro Telemetry Server Unity Network IX network port requires a crossover ethernet cable.

Windows NT or Windows 98	Windows 2000
NOTE: If BlackICE, VPN or any other firewall protection program is running on the service laptop, disable these services by following the process below. 1. From the Windows taskbar, click *Start* > *Settings* > *Control Panel* > *Administrative Tools* > *Services*. 2. In the list of available services, double-click the BlackICE service. 3. Click the *Stop* button: 4. Additionally, also stop any other firewall protection services. 5. After installation, to resume services, repeat process but click the *Start* instead of *Stop*.	
a. From the Windows taskbar, click *Start* > *Settings* > *Control Panel*. b. Click the *Network* icon in the Control Panel window. c. On the *Protocol* (or *Configuration*) tab, select the appropriate TCP/IP Ethernet adapter for your network card. d. Select *Properties*. e. Record the current IP address and subnet mask so you can restore them later. f. Click *Specify an IP address*. g. Type IP address, subnet mask and default gateway values matching the Unity Network IX network domain for the ApexPro Telemetry Server. For example: IP Address: 192.168.x.x Netmask: 255.0.0.0 Click *OK*. h. Click *OK*. i. Click *Yes* to restart the service laptop.	a. From the Windows taskbar, click *Start* > *Settings* > *Network and Dial-up Connections*. b. Right click *Local Area Connection*. c. Select *Properties*. d. Click *Internet Protocol (TCP/IP)*. e. Click *Properties.* f. Record the current IP address and subnet mask so you can restore them later. g. Click *Use the following IP address*. h. Type IP address and subnet mask and default gateway values matching the Unity Network IX network domain for the ApexPro Telemetry Server. For example: IP Address: 192.168.x.x Netmask: 255.0.0.0 Click *OK*. i. Click *OK*. j. For Windows 2000, instead of restarting the service laptop, you can click *Start* → *Settings* → *Network and Dial-up Connections*, right-click on *Local Area Connection*, select *Disable* and then right-click again and select *Enable.*

For your notes

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